AMERICAN GAS ASSOCIATION MONTHLY

OCTOBER · 1938

The Gas Short Course Comes of Age
W. H. CARSON

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Sales Aids for Gas House Heating
F. H. TREMBLY, Jr.

•

Home Service Can Keep Customers
BEATRICE STREGE

•

Wage Incentive Plans That Work
J. L. CONOVER

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1938
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AMERICAN GAS ASSOCIATION MONTHLY

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FASTER, CLEANER THAN YOU EVER DREAMED

HERE ARE JUST A FEW of the wonderful time and work saving features you'll find on the modern Gas Ranges. Every housewife should have the benefit of these advantages—you're missing something if you haven't got them!

NOW CHECK THE FEATURES YOU HAVE ON YOUR PRESENT RANGE!

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- ☐ **AUTOMATIC LIGHTING**—No matches to strike—No waiting—Instant heat.
- ☐ **GIANT BURNER**—For fastest top-stove cooking. Extra wide heat spread for large utensils.
- ☐ **NEW TYPE TOP BURNERS**—Direct flame toward bottom of utensils—save gas—won't clog.
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- ☐ **HEAT CONTROL**—Assures *exact* oven temperature required. No more "guess-work" baking.
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- ☐ **FAST PRE-HEATING OVEN**—Reaches maximum oven heat in fraction of time required by ordinary ranges.
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ATTENTION—Every Woman Who Cooks! Here's a really *modern* way of cooking you'll want to know more about right away!

This advance in cooking routine is made possible by the marvelous new Gas Ranges. You just can't imagine how *different* they are—how much of the cooking job they'll take off *your* hands.

You'll "ah" with delight when you see all their thrilling automatic features and the pull-out smokeless broilers. And when you realize what these up-to-the-minute improvements can mean to you in comfort, money-saving and finer meals, you'll want a modern Gas Range in *your* kitchen without delay.

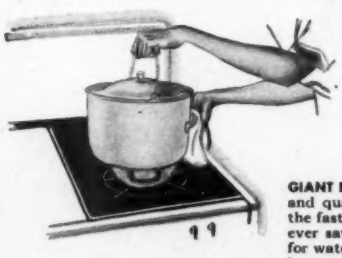
See the stunning new models at your Gas Company showroom or Appliance Dealer's. You've got a grand surprise coming, for they look as smart as they act!

AMERICAN GAS ASSOCIATION

CLEANING UP'S A CINCH! "Spillovers" present no problem on a modern Gas Range. Newly designed top burner grates lift out easily—burners are "non-clog." The gleaming porcelain-enamel finish of the range itself is kept sparkling-clean with a damp cloth. Even oven and broiler compartments are porcelain-enamel lined.

THIS SEAL represents the latest developments in cooking equipment. It stands for 22 super-performance standards established by the American Gas Association. Leading gas range manufacturers are now making de luxe ranges that include *all* 22 features. Such ranges are identified by the CP Seal which signifies "Certified Performance." *Every* modern Gas Range meets many of these standards. There is a size and model to fit every home requirement—every pocketbook!

CP



GIANT BURNER for speed and quantity cooking is the fastest "starter" you ever saw. No long waits for water to boil. *All* top burners give *instant, intense* heat, of course—Gas is the "speedy fuel."

LET GAS DO THE 4 BIG JOBS • COOKING • WATER HEATING • REFRIGERATION • HOUSE HEATING

A. G. A. National Advertisements which will appear in the Saturday Evening Post *and Women's Magazines for November, December, and January*

AMERICAN GAS
ASSOCIATION
MONTHLY

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James M. Beall, Editor

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The Coming Gas Convention

DURING the week of October 10, Atlantic City, N. J., will be headquarters for the entire gas industry. Starting Monday, October 10, and continuing through Thursday, October 13, the twentieth annual convention of the American Gas Association will be in session in the resort city. The program which will be offered there, representing six months of intensive preparation on the part of hundreds of individuals in the gas industry, will have something of interest and value to every man in the industry no matter what position he holds.

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A glance at the program features, which were published in detail in the last issue of the MONTHLY and have been distributed to the membership, will reveal many compelling reasons for attendance. In the brief space of four days, there will be packed a wealth of concentrated information on the outstanding developments of the year, such as the CP range program, the architects' and builders' contests, national advertising, new sales aids, technical advances and industrial relations problems. The combined experience and ability of national experts will be available to make a penetrating analysis of these developments and many others. The theme of the convention is "Gas Marches On."

It is not yet too late to make reservations and each individual should give this matter his earnest consideration. Special trains from key points in the country will carry delegates to Atlantic City.

A significant departure in the general sessions program is the selection of the majority of speakers from outside of the gas industry. This was done to get an entirely new viewpoint on the industry's problems and the talented array of speakers assures a program of wide appeal.

N. C. McGowen, president of the United Gas Pipe Line Co., Shreveport, La., and president of the American Gas Association, will preside at the general sessions which will be held in the ballroom of the Atlantic City Auditorium. He will introduce such noted speakers as Dr. E. R. Weidlein, director of Mellon Institute of Industrial Research; Joseph E. Pogue, vice-president of Chase National Bank; Colonel Willard Chevalier, publisher of *Business Week*; and Hon. Alexander M. Mahood, president of the National Association of Railroad and Utilities Commissioners. President McGowen will also present an address on "The Industry and the Association" which is expected to set the keynote of the convention.

Appearing at the opening general session, Dr. Weidlein, who has been identified with the Mellon Institute of Industrial Research for 25 years, will discuss "The Aid of Research to Industry." As a scientist, inventor and author of many articles on industrial research achievements, he is eminently qualified to speak on this important subject. The first general session will also include an address by Merrill N. Davis, president of the Association of Gas Appliance and Equipment Manufacturers.

As president of the National Association of Railroad and Utilities Commissioners, Mr. Mahood's remarks on "Regulation" at the second general session will be received with great interest. An address on "Household Sales—Methods and Practices" will be given by Charles G. Groff, chairman of the board of Servel, Inc., who is a national authority on sales practices. Donald A. Henry, chairman of the Rate Committee, will open the session with a review of rate trends. This session will also include the presentation of various Association awards for distinguished achievement during the past year.

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Mrs. William D. Sporborg, of Port Chester, N. Y., has been selected to speak on "An Average Consumer Swaps Problems With the Gas Utilities." Widely known as a speaker on subjects affecting women's interests, Mrs. Sporborg has addressed many trade association conventions and meetings of women's clubs. She is a former president of The New York City Federation of Women's Clubs and chairman of The Department of Legislation of the General Federation of Women's Clubs, 1935-1938.

"What the New York World's Fair Means to Industry" is the title of an address to be made by Floyd L. Carlisle, chairman of the board of the Consolidated Edison Co. of New York, Inc. As a member of the board of directors and the Finance Committee of the New York Fair, Mr. Carlisle is particularly well fitted to discuss the subject from every angle, including the Gas Industry exhibits.

Joseph E. Pogue, who has been closely identified with the petroleum industry for many years, will discuss the "Opportunities and Responsibilities of the Natural Gas Industry." In October, 1936, Mr. Pogue was elected a vice-president

of The Chase National Bank of New York City and his work in that organization has continued to be in the field of gas and petroleum economics. He is the author of "The Economics of Petroleum," co-author of "America's Power Resources" and has contributed many articles to scientific and industrial publications. In April of this year he was appointed a member of an Advisory Committee on Economics to the Interstate Oil Compact Commission. His views of the natural gas industry carry the weight of exceptional experience.

The Golden Gate International Exposition, which will include a large cooperative gas exhibit, will be discussed at the third general session by R. E. Fisher, vice-president of the Pacific Gas & Electric Co. Mr. Fisher is chairman of the committee in charge of the gas industry's participation in the exposition.

National Advertising Topic

The vital subject of "National Advertising" will be presented by Colonel Chevalier, publisher of *Business Week* and vice-president of McGraw-Hill Publishing Company. With an impressive background not only in the publishing field but as a leader of national cooperative organizations, Colonel Chevalier is well fitted to shed new light on the advertising problems of the gas industry. He is noted for his ability as an engaging and effective speaker.

The final general session will also include a report by Paul W. Herring, chairman of the Committee on Personnel Activities.

Labor and employee relations will hold the spotlight at a luncheon conference on Tuesday arranged by the Committee on Personnel Practices. H. F. Browne, director of the Management Research Division of the National Industrial Conference Board, will discuss "Elements of a Sound Industrial Relations Program." Mr. Browne has been a member of the staff of the National Industrial Conference Board for 15 years. He was appointed by President Hoover in 1930 to the Advisory Committee on Employment and Unemployment Statistics. In 1931, he was assigned to the Committee on Industrial Decentralization and Housing. He has had wide experience in industrial management.

President McGowen

Col. W. Chevalier

Merrill N. Davis

Joseph E. Pogue

Floyd L. Carlisle

Chas. G. Groff

Alex. M. Mahood

H. F. Browne

Dr. E. R. Weidlein

R. E. Fisher

Donald A. Henry

Dr. J. Brian Eby

Comprehensive programs for sectional and departmental meetings have been prepared to cover in detail specialized problems within the scope of their activities. These programs were published in the September issue of the MONTHLY. Headquarters for these meetings will be as follows: Natural Gas Department and Technical Section at the Hotel Ambassador; Accounting Section at the Ritz-Carlton Hotel; Commercial and Industrial Gas Sections at the Hotel Traymore.

The Entertainment Committee has arranged an outstanding program featuring the appearance of Miss Jessica Dragonette, noted radio soprano, and Joseph Dunninger, world famous master mind of mental mystery. There will also be dancing to the music of a well-known orchestra on two evenings during the convention, and other attractions. Atlantic City itself has much to offer in the realm of entertainment.

Following is the detailed program of the three general sessions:

GENERAL SESSIONS

TUESDAY MORNING, OCTOBER 11

10:00 o'clock

Auditorium

Welcome to Atlantic City.

Association's Finances

Joseph F. Rooney, Treasurer, New York, N. Y.

Election of Officers

The Aid of Research to Industry

Dr. E. R. Weidlein, Director, Mellon Institute of Industrial Research, Pittsburgh, Pa.

The Manufacturer's Viewpoint
Merrill N. Davis, President, Association of Gas Appliance and Equipment Manufacturers, New York, N. Y.

The Industry and the Association—President's Address
N. C. McGowen, President, United Gas Pipe Line Company, Shreveport, La.

EXECUTIVE SESSION
12:00 Noon
(Only company member delegates are eligible to attend)

Election of Company Members
Election of Directors
Election of General Nominating Committee
Election of Committee on Resolutions

WEDNESDAY MORNING, OCTOBER 12
10:00 o'clock

Trends in Rates
Donald A. Henry, Chairman, Rate Committee.

Regulation
Hon. Alexander M. Mahood, President, National Association of Railroad and Utilities Commissioners, Charleston, W. Va.

The Golden Gate International Exposition
R. E. Fisher, Vice-President in Charge of Sales, Pacific Gas & Electric Company, San Francisco, Calif.

Presentation of Association Awards
Meritorious Service Medal, Charles A. Munroe Award, Beal Medal.

An Average Consumer Swaps Problems with the Gas Utilities
Mrs. William Dick Sporborg, Chairman, Department of Legislation, 1935-1938, General Federation of Women's Clubs, Port Chester, N. Y.

Household Sales—Methods and Practices
Charles G. Groff, Chairman of the Board, Servel, Inc., New York, N. Y.

THURSDAY MORNING, OCTOBER 13
10:00 o'clock

Personnel
Paul W. Herring, Chairman, Committee on Personnel Activities, Chicago, Ill.

Opportunities and Responsibilities of the Natural Gas Industry
Joseph E. Pogue, Vice-President, Chase National Bank, New York, N. Y.

What the New York World's Fair Means to Industry
Floyd L. Carlisle, Chairman of the Board, Consolidated Edison Company of New York, Inc., New York, N. Y.

Report of Resolutions Committee

Report of Time and Place Committee

National Advertising
Colonel Willard Chevalier, Publisher, *Business Week*, New York, N. Y.

The Merits of Individual Membership in the American Gas Association

By WALTER C. BECKJORD
Chairman, Membership Committee

"Why should I join the American Gas Association?"

"What does it offer to do for me?"

Those are fair questions. You, who are invited to become a member, have a right to ask them.

Most men and women who occupy top executive positions in the gas industry are already Association members. Hundreds of others—young men and women—who will be the executives of tomorrow are also members. If you are in this latter class, then the Association is definitely interested in you.

Specifically, Association membership offers you:

A year's subscription to the AMERICAN GAS ASSOCIATION MONTHLY which reflects the best thought of the industry in all its phases.

Various mailings on subjects of industry-wide concern, including interim bulletins and reports of certain sections.

The privilege to purchase official Committee reports, convention addresses, annual convention proceedings, etc., at one-half the price quoted to non-members.

The opportunity to write Association Headquarters for help on any gas-industry subject, thus utilizing the services of a staff of experts, a library second to none in this country, a comprehensive data file and a complete statistical service.

The free use of the Association's Personnel Service (employment bureau).

The opportunity to serve as a Committee member and to contribute out of your own experience to the advancement of the gas business.

The opportunity to participate in conferences and convention sessions.

If you desire to make it do so, Association membership will give you a tangible dollars and cents return. It will aid you in your own job. It will widen your horizon and broaden your viewpoints. It will keep you in touch with gas industry policies, problems and the latest trends. It will make you better equipped to shoulder larger responsibilities. Finally, you will be personally and actively associated with the thinkers and the doers of the gas business.

You get out of anything just what you put into it; nothing can be accomplished without organized effort. An individual membership in the American Gas Association offers to you a very definite opportunity to be of real service to the industry, whose destinies cannot be disassociated from your own welfare. With no present Association affiliation, you lose the very real benefits that membership offers, but far more important than that, you penalize the growth of the gas business to whatever extent your active assistance would further it.

The Gas Measurement Short Course Comes of Age

By W. H. CARSON

Dean, College of Engineering, University of Oklahoma, Norman, Okla.

MOST men of the natural gas industry are familiar with the function of the Southwestern Gas Measurement Short Course. Nevertheless, a short review of the activities of this course should be of interest to all.

The present course is the outgrowth of a school known by the name of the Oklahoma Gas Meter Short Course. Suggested by W. H. Crutcher, the school was held for the first time in 1924 at the University of Oklahoma, Norman, Oklahoma, with approximately sixty men in attendance.

Object of Course

The primary object of this first short course was to teach meter repair men how to repair tin-case meters. It was requested that those who contemplated attending the course bring overalls as they would be expected to work in the laboratory, actually repairing meters. A large array of soldering coppers, blow torches and screw drivers were assembled for the occasion and were actually used during the laboratory period.

John H. Baxter, who was largely responsible for organizing the curriculum of the short course, was also one of the instructors. He served as general chairman of the course during the years of 1924, 1925, and 1926.

An amusing incident occurred on the opening day of the second gas meter school. The university student paper carried the headline, "Second Annual Oklahoma Short Meter Readers Gas Course Convenes Today." A number of Norman ladies called up and asked if they could attend, saying that they wanted to learn how to read meters so they could check the gas company's figures.

During the second and third years in which the short course was held, there was some deviation from the original plan of conducting the school in that considerable attention was given to studying the operation of the wet gas meter and the proportional meter.

Prof. Carson

During the third year of the school's existence manufacturers were invited to display any gas measurement equipment which might be used for educational purposes and some classes of an elementary nature were held, the object of which was to familiarize the gas measurement man with the physical laws governing the flow of gases.

Widespread Popularity

The Oklahoma Gas Meter School became so popular in 1925 that it attracted men from other states. The name was changed from the Oklahoma Gas Meter School to the Southwestern Gas Meter School and later to the Southwestern Gas Measurement Short Course.

The proceedings of the short course were first published in 1926. At that time a definite policy was established whereby a bulletin would be issued every two years.

In 1927 it was decided to increase the scope of the gas meter school. The general committee was enlarged from eight to fourteen men, and E. A. Clark was appointed general chairman. Subcommittees were appointed so that the burden of organizing the school would not fall so heavily on the shoulders of the general chairman as it had in the past. These committees were: 1. Banquet, entertainment and local arrangement committee; 2. Program committee; 3. Registration committee; 4. Exhibits committee; 5. Publications committee. At a later date a sixth committee was instituted with the title of Committee for Study of Practical Methods. It has been deemed advisable to increase the personnel of the general committee from time to time until there are now twenty-two members.

The men who have served as chairmen of the short course, and the year during which they served, are listed below:

John H. Baxter	1924–1925–1926
*E. A. Clark	1927–1928
F. D. Franks	1929
D. A. Sillers	1930
C. B. Day	1931
B. L. Maulsby	1932
No Short Course	1933
W. R. McLaughlin	1934
*D. C. Williams	1935
R. D. Turner	1936
E. E. Stovall	1937
Gilbert Estill	1938

L. G. Rheinberger, Active Chairman for 1939 school.

* Deceased.

In 1930 Chairman D. A. Sillers wrote a summary covering the history and organization of the gas measurement short course, and proposed that this material be published in pamphlet form and mailed to all persons interested in the school. Mr. Sillers' proposal was approved by the committee and each succeeding year a similar pamphlet has been prepared by the chairman and mailed to the men of the industry. The material covered in this pamphlet is so comprehensive that it is being incorporated verbatim at this point as part of this article.

"It was suggested by W. H. Crutcher to the Oklahoma Utilities Association and sponsored by this As-

Students receiving instruction during the early days of the gas measurement short course

Periodic conferences are held by members of the general committee during the course. Left to right, around the desk, are: G. W. McCullough, chairman, Publications Committee; Gilbert Estill, chairman, General Committee, 1938; W. H. Carson, chairman, Banquet, Entertainment and Local Arrangement Committee; and L. G. Rheinberger, chairman, Program Committee

sociation, the Oklahoma Corporation Commission, and the College of Engineering of the University of Oklahoma. The first meter school was held at the University in 1924. During succeeding years the enrolment has grown from 60 at the first school to more than 500 at the 1936 school. This growth reflects the untiring work of the various committee members and the interest shown by the industry in this valuable work.

Aim

"It is the aim and purpose of the Gas Measurement School to provide, through the cooperation of the University, the various Associations, and Gas, Gasoline and Oil Companies, a means whereby the men in the industry may get together to study problems pertaining to the measurement and regulation of dry and casinghead gas. It is hoped thereby to increase the accuracy of measurement and efficiency of regulation to the end that the public may better be served, the dealings between buyer and seller put on a more accurate and equitable basis, and that correct information regarding the engineering and practical problems involved be disseminated among the men in the industry.

Organization

"The general committee shall be composed of approximately fifteen active members. They shall be selected yearly by the General Committee. The College of Engineering of the University of Oklahoma, the Oklahoma Utilities Association, the Oklahoma Corporation Commission, Natural Gas Department of the American Gas Association, Natural Gasoline Association and several of the larger equipment companies, shall always be represented on the committee. The remaining members shall be drawn from representative gas, gasoline and oil companies, the personal qualifications of the individual as an active and valuable member of the committee being considered rather than the size of his company.

"The chairman of the general committee for the succeeding year shall be elected from among the gas, gasoline or oil company membership of the general committee at the last committee meeting at each meter school. As soon as is practical, before the close of the school, the new general chairman will appoint, from among the members of the general committee, a chairman for the Practical Methods Committee so that the entire year may be devoted to this work. At the expiration of the term of the chairman of the general committee, he shall automatically become an ex-officio member.

"At the first meeting of the new committee, the chairman of each of

the various subcommittees will be chosen by a majority vote. Each subcommittee chairman shall appoint the members of his committee.

Operation

A. REGISTRATION. "Any person interested in the measurement and regulation of gas may attend the course by payment of the registration fee. The amount of the registration fee will be determined by the committee, and will include the banquet ticket. All persons attending the school shall be required to pay the registration fee except members of the student body of the University, who shall not be required to pay fee in order to attend classes. The chairman of the general committee shall be authorized to dismiss any person from the school for good and sufficient reasons, and without refund of fee.

B. INSTRUCTION. "Instructors shall be appointed by the chairman of the program committee from among any persons available, first consideration being given to the competence of the instructor regardless of his company connections.

C. EQUIPMENT EXHIBITS. "The chairman of the exhibits committee will be charged with sending invitations to all equipment companies handling equipment for the measurement and regulation of gas. Companies not receiving invitations should apply for same to the chairman of the exhibits committee. Equipment other than for the measurement and regulation of gas shall not be exhibited. The chairman of the exhibits committee shall allot space to the exhibitors. There shall be no charge or assessments made upon exhibitors other than the regular individual registration fee.

"Equipment companies have greatly assisted the school by providing their exhibits and instructors. They have limited themselves to providing instruction and service and have recognized the impropriety of competitive sales work during the session of the school. At the request of the committee they have refrained from what is known as 'convention entertaining.' This high class of cooperation is appreciated and is considered vital to the continued success of the school.

D. FINANCE. "At the first meeting of the general committee the previous treasurer shall make his report and the next treasurer shall be voted upon. If possible, the expenditures of the school will be met by registration fees. If a deficit should occur, subscriptions should be taken from among the larger gas, gasoline and oil companies. The proceedings of the school shall be published by the University at such times as seem practical to the committee and when the finances justify.

E. PRIZE PAPERS. "To stimulate interest in the school, prizes will be awarded to those attending for the best papers written on what the writer learned at the school. This will not include members of the general committee, or manufacturers' representatives."

In closing I wish to say that I attribute the success of this short course to the fact that it is conducted as a school and not as a convention and to the untiring efforts of the committee members, the close cooperation of the various organizations sponsoring the short course, the interest and encouragement given by the executives of the various operating companies, the fine attitude of manufacturers of gas measurement equipment who each year bring educational displays to the school, and the ever-prevailing fine spirit of those in attendance who always conduct themselves as students who are desirous of learning more about the problems involved in gas measurement.

United States Housing Projects Cited as Gas Industry Opportunity

W. C. Beckjord

THE gas industry's opportunity offered by numerous United States Housing Authority Projects being developed throughout the country was disclosed when gas companies and manufacturers of gas appliances were urged to make every possible effort to assure gas being used wherever possible in these new government projects. It has been pointed out that if the opportunity is fully taken advantage of, the nation-wide interest centered on these housing projects will give an immediate stimulus to the use of gas as a fuel and have great future beneficial effects.

Action to this end in the interest of having gas and gas appliances specified in the projects was stimulated by W. C. Beckjord, vice-president of the Columbia Gas and Electric Corporation, in a letter addressed to the heads of all gas companies located in communities where funds have been allocated for housing projects. In his letter, Mr. Beckjord states: "Naturally it is very much to the interests of the gas industry that the Four Big Jobs; namely, cooking, water heating, refrigeration and house heating, be done with gas, and I know you are leaving no stone unturned to see to it that the merits of gas are being presented to the proper authorities who have this matter in hand.

"In these times, particularly, a highly competitive situation exists in the scramble for business of all sorts and more so in domestic equipment in the new housing facilities, so it behooves the industry to make every effort possible to sell the merits of gas. It not only reacts on the local situation, but has an effect nationally. Because these projects are so thoroughly advertised, the details of construction are quickly known all over the country."

The American Gas Association has taken active steps to assist all gas companies in whose territory United States Housing Authority projects are to be built. About twice a week, the United States Housing Authority issues lists of the applications for loans from local authorities. As soon as the list is received at A. G. A. Headquarters, letters are sent out to the gas company serving the area in which a new project is being planned. These letters advise the gas company regarding the procedures which must be followed to have gas specified for the project.

Much information has been collected from past experience with the Public Works Administration under whose supervision slum clearance projects were erected. The latter program erected fifty-one slum clearance projects of which twenty-five had one or more types of gas service, such as cooking, refrigeration, space heating or central heating, etc.

The several stages through which a project must pass before the contracts can be signed are too complex for detailed discussion here, but the complete story is being sent to each gas company along with the material already mentioned above. At the present time United States Housing Authority loans totaling $202,807,000 have been approved for 43 cities. In addition, there is $316,466,000 earmarked for 86 additional cities which have indicated their desire for a slum clearance program. There are 129 cities in the entire program now.

Sales Aids for Gas House Heating and Air Conditioning

F. H. Trembly, Jr.

By FRANK H. TREMBLY, JR.

Chairman, House Heating and Air Conditioning Committee

This article describes the work accomplished by the House Heating and Air Conditioning Committee of the Commercial Section during the past year. All of the subcommittee reports mentioned have been printed as Interim Bulletins and are available at Association headquarters.

THE 1938 House Heating and Air Conditioning Committee accepted as its assignment the general promotion of gas house heating throughout the country, and, in addition, has investigated certain specific fields in which more detailed study was needed.

This has included a study of the new developments in gas heating equipment, with particular reference to engineering improvements, an inquiry into the progress made in both winter and summer air conditioning, and an analysis of the advancement of gas heating, particularly in the new home field.

It was felt that greater progress could be made by appointing subcommittees, each dealing with a single phase of the General Committee's activities. It can be said that this procedure was most effective and that the annual reports will reflect a great deal of constructive work on the part of these subcommittees. This year's subcommittees and chairmen are as follows:

Engineering Developments—Thomson King, assistant manager in charge of gas heating sales, Consolidated Gas Electric Light & Power Co. of Baltimore, Md.

Improved Selling Practices—H. P. Morehouse, general air conditioning representative, Public Service Electric & Gas Corp., of New Jersey, Newark, N. J.

New Homes—H. G. Schaul, manager, industrial and house heating division, Westchester Lighting Co., Mt. Vernon, N. Y.

Air Conditioning—L. Ourusoff, engineer of utilization, Washington Gas Light Company, Washington, D. C.

Domestic Direct Heating—C. B. Wilson, new business manager, Arkansas-Louisiana Gas Co., Little Rock, Ark.

Engineering Handbook—C. G. Segeler, American Gas Association.

REPORTS PRESENTED

The Engineering Developments Subcommittee has included in its report a study of heat economizers, further information on the Dunham boiler, an analysis of automatic lighting devices, a discussion of clock versus plain room thermostats and their effect on gas consumptions, an analysis of the economics of obtaining domestic service hot water from space heating boilers, a study of lower price conversion and blast type burners. This report will clear up many points of uncertainty with respect to these developments and points a way to future study.

The Improved Selling Practices Subcommittee has made considerable progress in extending the use of house heating promotional materials. The slogan "Join the Swing to Heating by Gas," expressed in an original design, has been adopted by a large number of eastern gas utilities and has been officially recognized by the House Heating Division of the A.G.A.E.M.* A more widespread knowledge of this slogan should give it national acceptance. This would be most desirable, as it provides a uniform slogan for gas house heating promotion and advertising, and permits one utility to benefit from another's advertising.

The committee also revised the house heating sales presentation manual of the Public Service Gas & Electric Corporation of New Jersey and has recommended to the Association that this splendid presentation material be published for general sale to the gas industry as a guide for companies preparing their own manuals.

The New Homes Subcommittee has thoroughly surveyed the new home market for gas heating and has arrived at the following important conclusions:

1. Gas house heating definitely insures the retention of the other domestic appliances.
2. Specialized house heating selling personnel in the building field has been found most effective.
3. Special incentives to builders for installing gas house heating have been found desirable, particularly where gas is being introduced into this field.
4. The "All-Gas Home" national program is a powerful sales tool that should be utilized by all utilities in promoting the sale of gas heating to new homes.
5. Newer developments in home construction and new methods of heating, place gas in an unusually favorable position, so far as small home and apartment usage is concerned.

The Air Conditioning Subcommittee has made a study of the progress of winter air conditioning during the year, identifying certain new gas units which have been developed and reporting on the load factor of complete gas service in the smaller homes. Further, it has analyzed the advantages to the gas industry of forced circulation warm air heating as contrasted with other types.

This committee has also reported on residential winter humidification, analyzing the available equipment, recommending reconsideration of certain past assumptions as to the proper humidity and analyzing the approximate fuel consumption for residence humidification in various size dwellings.

The committee made no report on summer air conditioning, inasmuch as Mr. Ourusoff (chairman of the sub-

* A detailed description of the slogan and suggestions for its use are contained in an article by H. P. Morehouse on pages 312 and 313 of the A. G. A. Monthly for September.

committee devoted to this activity) is a member of the Special Industrial and Commercial Air Conditioning Committee, which was appointed by the Committee of Executives on Air Conditioning to study the various aspects of gas summer air conditioning. His report on residential air conditioning, as a member of this special committee, will be published in the proceedings of that committee.

The Domestic Direct Heating Subcommittee described the available field for direct-heating appliances and analyzed their value as load builders. They recommended that consideration be given to the load-building value of these appliances in compensating salesmen, in the belief that added compensation over the merchandise value was justified in view of added load obtained.

The Engineering Handbook Subcommittee published the handbook, *Comfort Heating,* in May, 1938, largely the result of the work of the previous year's committee, which was continued for this year. This is a complete, authentic, heating handbook containing material not previously available and is certain to be of great value to every utility interested in house heating. Its use greatly simplifies proper estimating and the correct specification of gas equipment. The General Committee strongly recommends its extensive use by the industry.

A Special Report on Floor Furnaces has been prepared, in which the market was analyzed, showing that approximately 100,000 units were sold in 1937. A study was made of the types of appliances replaced by floor furnaces and an analysis made showing the advantages and disadvantages of floor furnaces to both the utility and the customer. Recommendations were made with respect to the sale, installation and design of this equipment, which should still further increase its acceptance.

An installation guide, *Recommended Practice for Installation of Gas Winter Air Conditioning in New Homes,* has been reproduced for distribution to the gas industry. This guide was prepared by the Metropolitan House Heating and Air Conditioning Council, by a special committee under the chairmanship of H. P. Morehouse. The committee deserves great credit for the thoroughness of this guide.

It is a necessary adjunct to the proper installation of gas heating in new homes as it standardizes workmanship and avoids poor performance by insuring adequate sizing and proper installation of duct work and equipment. Its more general use by the industry is recommended by the Committee.

International Heating and Ventilating Exposition

The next convention and exposition will be held Jan. 22-26, 1940, in Cleveland, Ohio, and it is recommended that a special subcommittee, reporting to this General Committee, be appointed this next Association year to correlate the activities of both the utilities and manufacturers to the end that a joint display be arranged.

It is suggested that the Heating Equipment Manufacturers, American Gas Association, and the Gas Utilities adjacent to the exposition location share the expense of a joint display. Such a program will greatly improve the quality and effectiveness of the gas heating exhibit.

National House Heating Sales Contest

In collaboration with the Heating Section of the A.G.A.E.M., a study was made as to the possible results accruing from a national gas house heating contest.

A contest plan was prepared, covering the period April 1 to October 1, 1938, using a type of contest wherein salesmen would not be competing with each other. Such competition would be unfair, because of the great variation in rates and selling opportunities between various utilities.

It was decided to take no action this year in such a contest, though it received much favorable consideration, with the intention of recommending such a program next year as a stimulus to gas heating sales.

Under the Stars and Smokeless Skies
. . . the Cleanliness of a Natural Gas Community
SOUTHERN CALIFORNIA GAS COMPANY
SOUTHERN COUNTIES GAS COMPANY
Natural Gas ...FOR THE 4 BIG JOBS

A current newspaper advertisement of the Southern California Gas Company which emphasizes the cleanliness of natural gas fuel

Spring and Fall Heating

It was felt proper that some comment should be made regarding the use of removable gas burner equipment for temporary installation in customers' furnaces to obtain an added load during the spring and fall months.

The experiences of a number of utilities with this approach to house heating sales has not been consistent, with some reporting satisfactory results and others finding the field unattractive.

Where a satisfactory rate is available there is much to be said for the sale of acceptable gas equipment for such spring and fall usage and it gives a substantial number of customers actual personal experience as to the convenience of gas heating.

A careful sales program is necessary in order to prevent the promotion of seasonal heating resulting in a negative reaction to total gas heating on the part of both the company employees and the general public. It is believed that this can be avoided by the proper sales approach.

In many cases, such spring and fall customers have been easily converted to total gas heating and in other cases they have remained as partial heating customers providing to the utility a desirable annual revenue ($25 to $40 per year), all of which is obtained during months which represent no heating peak.

As greater saturation in gas house heating is obtained, it is believed that

(Continued on page 367)

New CP Salesmaker Augments the Gas Range Campaign

F. M. Houston

By F. M. HOUSTON

Chairman, Domestic Range Committee, Rochester Gas & Electric Corp., Rochester, N. Y.

AT the last meeting of the Domestic Gas Range Committee of the American Gas Association, details and plans for a CP Salesmaker were discussed. This committee is composed of six members of A. G. A. and six members of A.G.A.E.M., causing both the utility and manufacturer's viewpoints to be incorporated in the publication of this sales prospectus.

Since the time of the above meeting, many additional suggestions and ideas for this valuable sales tool have been received. The best of all the ideas are now being consolidated by R. S. Agee, sales promotion manager of the Association of Gas Appliance and Equipment Manufacturers who are underwriting the production cost.

Visual Presentation

The CP Salesmaker will carry a complete, visual, non-technical presentation of the 22 points of superiority of CP gas ranges. The last 8 pages of the book are devoted entirely to the justification for purchase of a CP range by conclusive proof that CP ranges practically pay for themselves with their latest time-saving, fuel-saving, food-saving features. Four colors are used to produce those pages showing delicious food pictures.

This item was publicized by a description in the CP Sales Plan Book recently distributed to utilities. From that source alone so many samples have been ordered by utilities throughout the United States that sale of over 5,000 copies of this salesmaker is indicated. The sales price, as previously publicized, will be on a cost basis of $1.25 per copy.

Due to the general and institutional composition, the book is easily adapted to the promotion of the sale of any make of gas range. A pocket is provided in the back for the addition of the specific makes and models being promoted by a retail outlet.

The Association of Gas Appliance and Equipment Manufacturers reports that all orders now being received on this item will be filled by October 1, at which time all shipments of this new sales item will go forward.

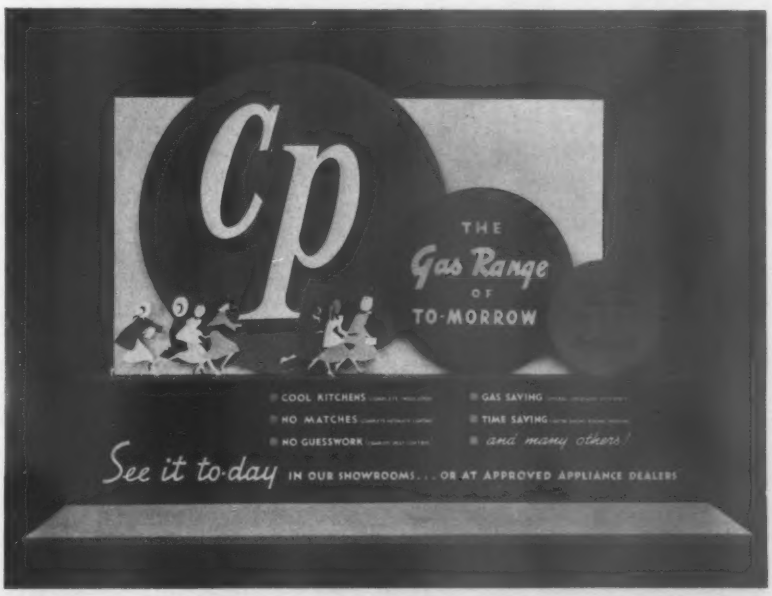
During the past four weeks orders for sales promotion material have been received from nearly three hundred companies for use in promoting the sale of Certified Performance gas ranges.

More than 2,500,000 pieces of direct mail and bill enclosures, 60,000 four-color blotters, 50,000 special items such as buttons, balloons and banks, 400 showroom banners and streamers, 400 window displays and 400 newspaper mats have been purchased.

The A. G. A. National Advertising Program has acquainted home makers with the meaning of the CP seal in two women's publications totaling 6,000,000 publication during the months of August and September. Other ads are scheduled for similar publication for the month of October. Many national magazines are carrying effective publicity stories on these new type ranges, including *Better Homes and Gardens* and *Pictorial Review—Delineator*.

Radio listeners have been told about the CP gas range through the excellent broadcasts of the Mystery Chef. Hundreds of requests for further information have been received since CP ranges were first mentioned.

Several manufacturers are also carrying the CP story in their own national consumer and trade advertising campaigns.



A striking window display of the Consolidated Edison Co. of N. Y. calls attention to the CP range. It was designed by Raymond M. Martin, art director of the company

Wins Convention Trip with High Sales

G. CECIL BRIERLY, new business manager of the Fort Collins district of the Public Service Company of Colorado, has emerged the victor in a six months' storage water heater sales contest conducted by the company among district new business managers in various properties over the state and the four Denver sales supervisors. The winning prize is a trip with all expenses paid to the annual convention of the American Gas Association in Atlantic City, N. J., the week of October 10.

In winning, Mr. Brierly sold 127 water heaters, matching his quota 100 per cent. The company has a saturation of better than 50 per cent in Fort Collins in both house heating and storage water heater usage, according to Roy G. Munroe, new business manager.

Mr. Munroe is justly proud of the record of Public Service Company of Colorado in the matter of saturation of gas water heating and house heating. He reports as follows:

"We have just crossed the 43 per cent line in saturation of automatic gas storage water heaters in the Denver district. We do not know of any other community with a population of over 50,000 where so high a percentage of the houses are equipped with automatic storage water heaters.

"At the same time, and notwithstanding that Denver is underlaid with one of the finest coal deposits in the world, and that excellent coal is mined in the suburbs and delivered into the bins of domestic customers at as low as $4.50 per ton, our company is now supplying gas for all purposes, including house heating, to almost exactly 20 per cent of all the houses in the Denver district. Our Denver heating season averages about 5,850 degree days."

"A. G. A. Safety News" Makes Its Bow in September

ON September 6, the first issue of A. G. A. Safety News made its appearance. Containing timely and pertinent articles on safety problems, arranged in news letter form, this new service to Association members is expected to fill a long felt need. It is issued by a special subcommittee of the Accident Prevention Committee, of which H. H. Berman, Consolidated Gas Electric Light & Power Co. of Baltimore, is chairman.

In a letter accompanying the first issue, Mr. Berman outlines the method and scope of Safety News, as follows:

The News Letter method is now recognized as an effective medium of disseminating information. The source of its material, gleaned from the experiences of its very practical membership should, we believe, afford a helpful, beneficial, exchange of thought. It might well be regarded as a clearing house on controversial subjects or methods.

This in time, will undoubtedly tend to simplify many previously complex problems; perhaps bring about changes in operations, and permit each of us to know the viewpoints of our contemporaries.

It is recognized, however, that to insure success in any venture cooperation is necessary. No single person of whatever talents he may be possessed could hope to qualify to the satisfaction of all, and it is with this thought in mind that we ask your participation in the publishing of subsequent A. G. A. Safety News Letters.

The columns of the news letter will be wide open for the expression of any viewpoint you may entertain and one may or may not (as he chooses) write under his name and title.

The subcommittee which edits Safety News is composed of the following: C. L. Hightower, United Gas Pipe Line Co., Houston, Texas, chairman; E. J. Kreh, Equitable Gas Co., Pittsburgh, Pa.; W. J. McVay, Consolidated Electric & Gas Co., New York, N. Y.; C. J. Gefvert, Consolidated Edison Co. of N. Y., Inc., New York, N. Y.

Keeping Pace with the A·G·A *All-Gas Home*

With the nationwide Architectural Competition sponsored by the American Gas Association for the design of *All-Gas Homes* an outstanding success, the spotlight of attention now focuses on the Builders' Competition for the construction of *All-Gas Homes*, using gas for cooking, refrigeration, water heating and house heating. Reports indicate that homes are under construction in many cities and that they will be built, publicized and demonstrated to many thousands.

Among some of the cities in which American Gas Association *All-Gas Homes* have been demonstrated are the following:

Hartford, Conn.: The first *A. G. A. All-Gas Home* in America, sponsored by the Hartford Gas Company. Viewed by 35,000 persons in one week, sold by the builder at the close of the second demonstration day, due to publicity received. The President of the Hartford Gas Company says: "Finest promotional effort ever undertaken by our company."

Washington, D. C.: *A. G. A. All-Gas Home* opened in Northwood Park, Md. Endorsed by Washington Gas Light Company. 4,000 persons passed through this home to date.

Webster Groves, Mo.: Fourteen *A. G. A. All-Gas Homes*, publicized by St. Louis County Gas Company, being constructed under competition.

Milwaukee, Wis.: *A. G. A. All-Gas Home* endorsed by Milwaukee Gas Light Company, viewed by 50,000 visitors.

Memphis, Tenn.: *A. G. A. All-Gas Home* demonstrated and publicized in cooperation with the Memphis Power & Light Company, viewed by thousands of persons.

White Plains, N. Y.: Seventy-seven *A. G. A. All-Gas Homes* ultimately to be built at Westminster Ridge. Two homes opened for demonstration in cooperation with the Westchester Lighting Company have received much publicity and have been well attended.

Syracuse, N. Y.: D. P. McCarthy, well-known builder of Syracuse, opened *A. G. A. All-Gas Home* for demonstration September 16—sponsored by Central New York Power Corporation.

Rochester, N. Y.: *A. G. A. All-Gas Home* opened for demonstration August 2—very well attended. Sponsored by Rochester Gas & Electric Corporation.

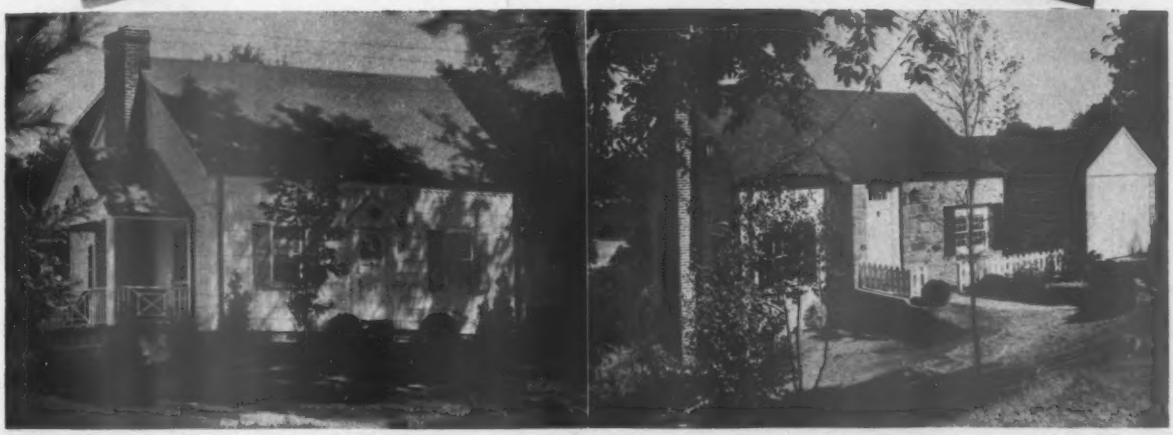
Advertising Maxim

SOME thirty years or more ago John Wanamaker wrote the following:

"If there is one enterprise on earth that a 'quitter' should leave severely alone it is advertising. To make a success of advertising one must be prepared to stick like a barnacle on a boat's bottom. He should know before he begins it that he must spend money—lots of it. Somebody must tell him that he cannot hope to reap results commensurate with his expenditure early in the game.

"Advertising does not jerk; it pulls. It begins very gently at first, but the pull is steady. It increases day by day and year by year until it exerts an irresistible power."

Gas Chosen for 77 Low-Cost Homes



TYING in with the national American Gas Association All-Gas Home program, 77 low-cost homes will ultimately be constructed at the Westminster Ridge Development, White Plains, N. Y. These homes will incorporate the theme of the program, "Use Gas for the 4 Big Jobs—Cooking, Water Heating, Refrigeration, House Heating." Lee Perry, architect and president of County Housing Corporation, is in charge of the development.

Two demonstration homes have been opened to the public.* Pleasant winding avenues, a community lake and playground combine with the distinctive architecture to give the homes individuality and charm. Accompanying photographs show typical houses in the development. The houses shown have five or six rooms, one or two baths, and range in cost from $6,650 to $8,000.

A strong booster for gas, Mr. Perry says: "After having been a firm believer in the use of gas for domestic purposes for the past fifteen years in larger homes, I was firmly convinced that its use in low cost housing would be equally successful. In planning Westminster Ridge, I therefore insisted upon gas being used for heating, hot water, refrigeration and cooking."

* An impressive ceremony, marking the opening of the homes, will be reported in the A. G. A. Monthly for November.

Getting the Competitive Facts by the Survey Method

By E. V. BOWYER

Commercial Manager, Roanoke Gas Light Co., Roanoke, Va.

E. V. Bowyer

OUR company recently completed a domestic gas market survey with such pertinent results that they will have a strong bearing on our sales policies for several years. In fact, we are firmly convinced that if other companies would conduct similar surveys, they would be more than compensated by improved business conditions. We were able to get into 97 per cent of all the homes in Roanoke and indications are that the survey is approximately 95 per cent accurate.

Results Are Significant

The original purpose of the survey was to make a close study of electric competition and to build up an active prospect file together with the type, age and condition of all cooking, water heating and refrigeration appliances used by all customers on our service lines. A significant fact revealed by the survey was that coal, oil and wood users are more competitive in our territory than electricity.

Our present gas users are as follows:

10,835 for Cooking
1,498 for Refrigeration
1,528 for Tank Water Heating
1,619 for Automatic Water Heating
491 for Space Heating
364 for Commercial and Industrial
42 for House Heating

We have 11,384 total customers without duplication out of a population of 75,463.

Immediate prospects for new appliances as uncovered by the survey were:

6,129 Ranges
4,281 Automatic Water Heaters
2,672 Refrigerators

The survey revealed the following competitive users on our service lines:

1,119 Electric Range
49 Electric Water Heater
4,216 Coal and Wood
1,813 Oil Range

7,197 Total Competitive Users

A survey sheet was used and kept in duplicate. From the survey sheets a complete card file record of the above users with the make of equipment, condition, etc., was made.

Cost Negligible

The survey was conducted by our regular territory men during their spare time. We employ regularly eleven territory salesmen on a combination salary and commission basis. The only direct additional cost for the survey we estimate at $60 for supplies. It required six months to complete the survey. The canvass sheets and records were prepared and kept by the writer's secretary.

Since making this survey we have canvassed the department and furniture stores, etc., and find that the total sale of coal, oil and wood ranges to the residents of our city, excluding rural districts, exceeded their sale of electric ranges almost by two to one during the year of 1937. Our problem is how to reach these competitive users.

In order to interest the coal, wood and oil users in gas service, we have worked out a standard proposition on a low-priced range whereby we offer $20 for the old equipment and sell the new equipment at $1 down and $2 per month. This has taken very nicely. We find that out of the 7,197 competitive users, approximately half are home owners with good credit. Most of them are railroad employees, especially engineers, who live in brick homes in the northwest section of town.

We are now conducting a complete House Heating, Commercial and Industrial survey, including an analysis of our dead services.

This article is published through the cooperation of the Market and Economic Research Committee, Commercial Section, John B. Reid, chairman.

Detroit Gas Company To Change Name

THE Detroit City Gas Co. will change its name to Michigan Consolidated Gas Co. The firm is a consolidation of the Detroit City Gas Co., Grand Rapids Gas Co., Washtenaw Gas Co. of Ann Arbor, and the Muskegon Gas Co.

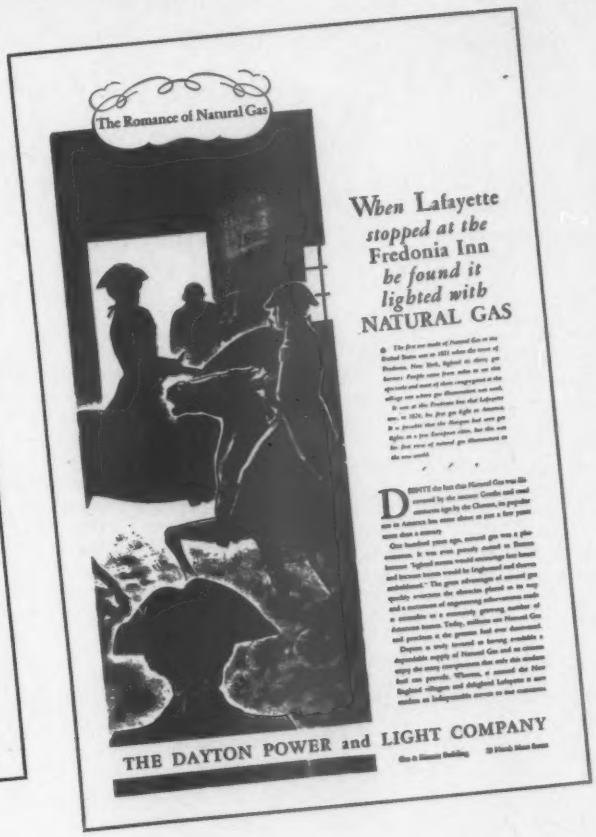
Domestic Gas Sales on Uptrend

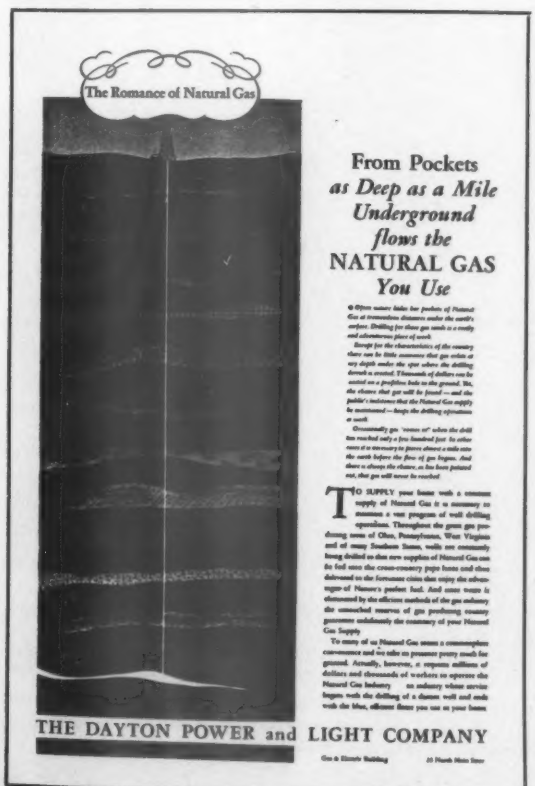
REVENUES of manufactured and natural gas utilities amounted to $52,717,900 in July, 1938, as compared with $54,001,000 for the corresponding month of 1937, a decrease of 2.4 per cent, according to figures just released by the A. G. A. statistical department. Revenues from industrial and commercial users fell from $20,007,000 a year ago to $17,640,600 in July, 1938, a loss of 11.8 per cent. Revenues from domestic uses such as cooking, water heating, refrigeration, etc., were $35,077,300 for July, 1938, as compared with $33,994,000 a year ago, an increase of 3.2 per cent.

The manufactured gas industry reported revenues of $27,731,500 for the month, a slight increase from the same month of the preceding year. Revenues from industrial and commercial sales of manufactured gas declined 7.9 per cent. Revenues from domestic uses were 2.3 per cent more than for the corresponding period of 1937.

The natural gas utilities reported revenues of $24,986,400 for the month, or 5.5 per cent less than for July, 1937. Revenues from sales of natural gas for industrial purposes decreased 17.5 per cent, while revenues from sales for domestic purposes increased 3.6 per cent.

The Romance of Natural Gas
NATURAL GAS
flowing through bamboo pipes first illuminated
Pekin, China
THE DAYTON POWER & LIGHT COMPANY


The Romance of Natural Gas
When Lafayette stopped at the Fredonia Inn he found it lighted with NATURAL GAS
THE DAYTON POWER and LIGHT COMPANY


The Romance of Natural Gas
From Pockets as Deep as a Mile Underground flows the NATURAL GAS You Use
THE DAYTON POWER and LIGHT COMPANY

A dramatic story of the romance of the natural gas industry is told in a new series of institutional advertisements of The Dayton Power and Light Company. Four of the current series are shown above

Association's Executive Board Reviews Cooperative Activities

AN important meeting of the Executive Board of the American Gas Association was held September 8 in New York. Vital activities of the Association were reviewed and a program for the new fiscal year, starting October 1, was discussed. N. C. McGowen, president of the United Gas Pipe Line Company, Houston, Texas, and president of the Association, presided.

T. J. Strickler, chairman of the Committee to Conduct National Advertising, reported on the progress of the national campaign to date and recommended a continuance of the program. The gas industry's participation in the New York World's Fair was discussed by Hugh Cuthrell, president of Gas Exhibits, Inc., the cooperative organization in charge of this activity.

A special Committee on Association Activities, under the chairmanship of H. L. Dickerson, made recommendations following an intensive study of the Association's work. N. T. Sellman summarized the high points of the Certified Performance Range Program. The report of the Finance and Control Committee was presented by Clifford E. Paige, chairman.

The Executive Board approved recommendations for awards to individuals for distinctive and outstanding achievement in the gas industry during the year. These include the Charles A. Munroe Award, the A. G. A. Meritorious Service Medal and the Beal Medal, all of which will be presented at the annual convention in October. A report was also presented on the award of McCarter Medals for life saving by the Schafer prone pressure method of resuscitation.

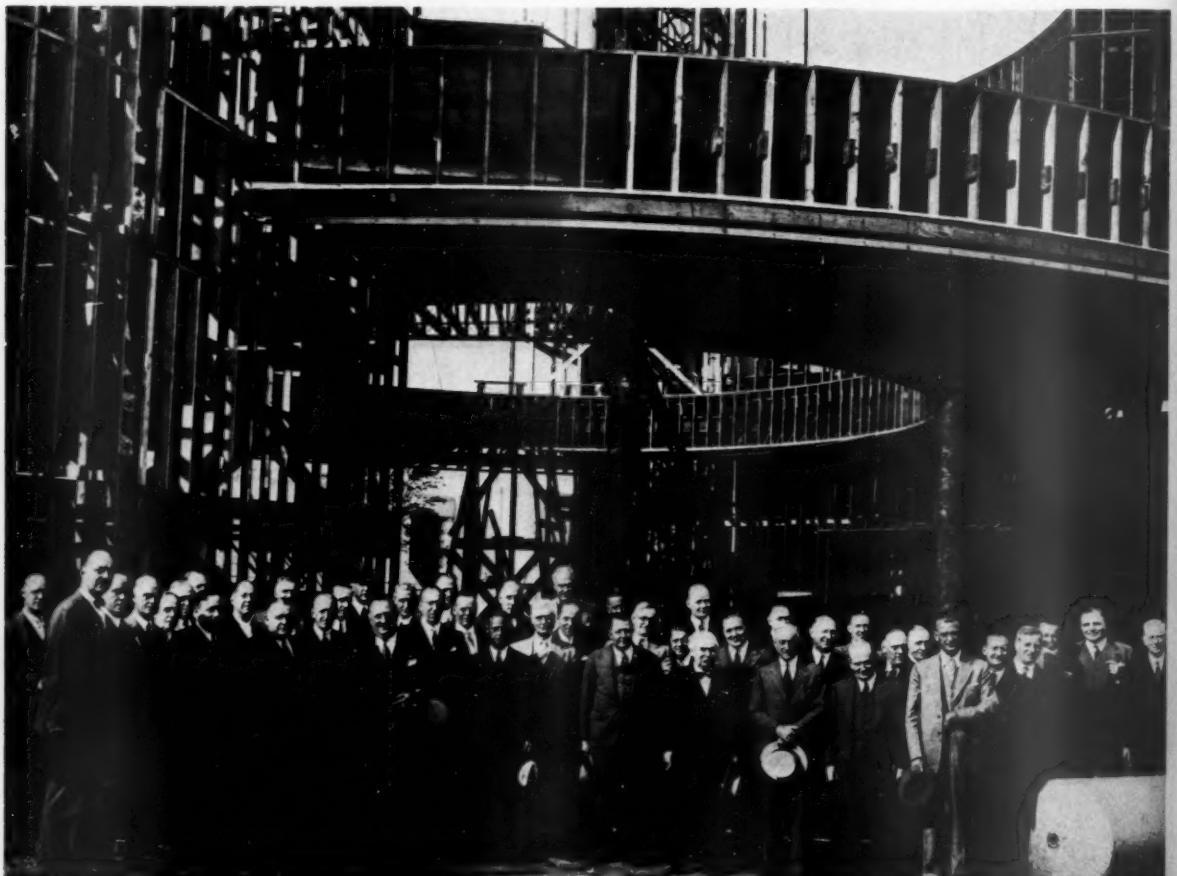
Other subjects reviewed at the meeting included: industrial gas research, home planning program, membership applications, and departmental and sectional activities.

Following the board meeting, the A. G. A. directors, together with the directors of the Association of Gas Appliance and Equipment Manufacturers, participated in a tour of inspection of the New York World's Fair.

In addition to those previously mentioned, the following were present at the meeting: Frank H. Adams, W. C. Beckjord, Hale A. Clark, Merrill N. Davis, W. E. Derwent, H. A. Ehrmann, George S. Hawley, Conrad N. Lauer, J. V. Postles, W. T. Rasch, J. F. Rooney, Otto Snyder, T. R. Weymouth, P. S. Young, Randall J. LeBoeuf, Jr., Alexander Forward, and Kurwin R. Boyes.

Rail and Utility Session, November 15

THE National Association of Railroad and Utilities Commissioners will hold its fiftieth annual convention at New Orleans, November 15 to 18. Subjects for discussion include affairs of the railroads, motor carriers and public utilities.



Directors and officials of the American Gas Association and the Association of Gas Appliance and Equipment Manufacturers pose for a picture during a tour of inspection of the New York World's Fair on Sept. 8. In the background is a section of the partially completed Gas Industry Building, which will house gas exhibits and other attractions during the Fair

Wage Incentive Plans That Work

John L. Conover

By JOHN L. CONOVER

Public Service Electric & Gas Co., Newark, N. J.

THE purpose of this paper is to describe the wage incentive plans in use in the Customers Billing Department of Public Service Electric and Gas Company.

In May, 1925, a wage incentive plan was adopted for billing machine operators. The plan was inaugurated seven months after the preparation of electric and gas bills was centralized, following the adoption of the stub plan of customers' accounting. It was recognized at that time that a wage incentive plan was essential to the high degree of production and accuracy required for the successful operation of the central billing department.

The wage incentive plan was designed to accomplish the following:

1. Increase accuracy and production
2. Decrease supervision
3. Decrease absence from work
4. Provide remuneration for each individual commensurate with individual ability
5. Guarantee a base salary
6. Decrease billing costs

The results accomplished by the wage incentive plan for billing machine operators more than justified its adoption. Similar plans since have been extended to three other groups in the Customers Billing Department.

The wage incentive plans in use today are described in what follows:

Billing Machine Operators

The billing machine operators prepare all electric and gas bills, except those for large power and wholesale gas accounts, on National billing machines. Approximately 1,000,000 bills are prepared each month by 35 billing machine operators working under the wage incentive plan.

Contributed by A. G. A. Committee on Personnel Practices.

Terms for Billing Machine Operators

(a) Each billing machine operator is guaranteed a base rate per month, usually $100, and is expected to earn the base rate under the terms of the wage incentive plan.

(b) The rate of compensation is 49¢ per 100 bills.

(c) A deduction for errors is made, based on the average number of errors per 1,000 bills. The rate per error is graduated, beginning at 5¢ per error for five or less errors per 1,000 bills, 6¢ per error for six errors per 1,000 bills, etc. The highest rate is 10¢ per error for ten or more errors per 1,000 bills.

Results for Billing Machine Operators

The results in so far as production and accuracy are concerned can best be illustrated by a tabulation of the records for the month of April, 1938, a typical month.

	Total Bills Prepared	*Average No. Bills Per Hour*	*Total Errors Made*	*Errors Per 1,000 Bills*
Operator with greatest production	41,508	390	99	2.3
Operator with least errors	36,744	330	24	.6
All operators on wage incentive plan	982,538	278	2,648	2.6

In addition to the above the wage incentive plan has accomplished the objectives desired when the plan was adopted in 1925. Labor turnover is negligible; some operators have been with the company since 1924.

Bill Auditing Department—Bill Checking Division

The bill checkers are responsible for the accuracy of every item appearing on the customers' bills, except the rate schedule and amount billed. Each bill is checked against the corresponding meter reading record to insure that a bill has been prepared, that the customer's name and address, reading dates, kilowatt hours, and cubic feet have been recorded correctly, that constants and special minimums have been applied, etc.

Terms for Bill Checkers

(a) A base rate of $100 per month is guaranteed to each bill checker.

(b) A production bonus of $25 is paid for checking a minimum of 50,000 bills per month.

(c) An additional bonus for accurate work is paid as follows: If not more than one error is reported the accuracy bonus is $10; if two errors are reported the accuracy bonus is $5; if three errors are reported no accuracy bonus is paid. For all errors over three a deduction of $2 per error is made, but in no case is the minimum wage less than $100 per month.

(d) For all bills checked in excess of 50,000 per month, the bill checkers are compensated at the rate of 75¢ per 1,000 bills, provided not more than three errors are reported.

Results for Bill Checkers

The incentive plan for bill checkers is designed particularly to attain a high degree of accuracy, rather than high production.

During April, 1938, the twenty checkers assigned to this work checked 1,059,288 bills, an average of 52,964 bills per employee. Only ten errors subsequently were reported by the district offices. These errors were charged to the bill checkers as follows: three checkers made one error each, two made two errors each, and one made three errors. Fourteen bill checkers made no errors during the month.

Bill Auditing Department—Auditing Division

The auditing clerks are calculator operators, and are responsible for the accuracy of the amounts billed. Proof of billing is established by distributing the total consumption for each rate by the steps of the rate, and extending the consumption so obtained by the rate to determine the revenue. This is done from analysis and proof sheets which contain the breakdown of consumption at each rate, by like blocks of consumption.

Terms for Auditing Clerks

(a) Each auditing clerk is guaranteed a base rate per month, usually $100, and is expected to earn the base rate under the terms of the wage incentive plan.

(b) The rate of compensation is 13¢ per 100 bills.

(c) A deduction of $1 for each error reported is made from the gross compensation for each operator.

Results for Auditing Clerks

The wage incentive plan for the auditing clerks is similar in purpose to the plan for the bill checkers in that it is designed to stimulate accuracy.

During April, 1938, the ten clerks assigned to this work audited 1,074,620 bills, an average of 107,462 bills per clerk. Only six errors subsequently were reported by the district offices. These errors were charged to the auditing clerks as follows: four clerks made one error each, and one clerk made two errors. Five clerks made no errors during the month.

Tabulating Department—Listing Clerks

The listing clerks in the Tabulating Department prepare the analysis of electric and gas sales by classes of business and by like blocks of consumption. This is done by the "tick" method directly from the meter reading records on analysis and proof sheets. The consumption totals so obtained must balance with the proof sheets obtained from the National billing machines.

Terms for Listing Clerks

(a) Each listing clerk is guaranteed a base rate of $100 per month and is expected to earn the base rate under the terms of the wage incentive plan.

(b) The rate of compensation is 13.5¢ per 100 accounts.

(c) A deduction of 25¢ for each error reported is made from the gross compensation of each clerk.

Results for Listing Clerks

The wage incentive plan for the listing clerk is designed to stimulate both production and accuracy.

In the month of April, 1938, the fourteen clerks assigned to this work listed 1,081,730 bills, an average of 77,266 bills per clerk. No errors were reported.

Other Incentives

In addition to the foregoing plans, which are strictly financial incentives in so far as the individual employees are concerned, the company has adopted other incentives which contribute to increased efficiency and better employer-employee relations.

In each of the groups compensated under the wage incentive plan there is a fixed amount of work to be done each day. Each group starts work at a given time, and when the work for the day is completed the employees are permitted to leave. As a result of this policy, employees work relatively few hours per day for the 21 days which they are on duty each month. A tabulation of the average hours worked per day for each group for the month of April, 1938, is shown below:

	Average Hours Worked Per Day
Billing machine operators	5 Hrs. 20 Min.
Bill checkers	6 Hrs. 20 Min.
Auditing clerks	6 Hrs. 0 Min.
Listing clerks	6 Hrs. 5 Min.

Vacations are granted on a merit basis for each group, instead of on the customary seniority basis. Efficiency reports maintained in the department show the individual ability of each clerk and serve as the basis for granting vacations.

Our experience with wage incentive plans has indicated that they are decidedly worth while and that they have contributed a great deal to the successful operation of the Customers Billing Department in Public Service Electric and Gas Company.

July 6, 1938

University Opens Cooking Class for Men Only

EVERY husband should cook dinner at least once a week, Miss Gladys M. Curry, dietician at New York University, said Sept. 13. The experience would not only give him first-hand information in his wife's problems in preparing meals, but would contribute to the family's unity, she said.

Beginning on September 26, Miss Curry will offer a cooking course for men students only. Described as the first course of it kind in a metropolitan college, it will be sponsored by the department of home economics of the School of Education. Professor Freda J. Winning, head of the department, said that although there had been several male students in her generally feminine classes, there would be absolutely no women in the new class.

"Men are often better cooks than women, and they should be," Miss Curry said. "Usually they are fonder of food than women, and although they can't plan a meal as well, they can usually turn out quite a palatable meal from a simple recipe.

"As man has a more scientific mind than woman he has naturally a more natural mechanical ability, and to him preparation of the evening meal is as much of a challenge to his ability as building a boat.

"More men are cooking today than ever before. This is partially because modern kitchen devices have removed much of the kitchen drudgery, and recipes are much simpler than they were in grandmother's day. Also, perhaps quite importantly, because changes in our economic order have made men more interested in the activities surrounding their homes."

The course will begin on September 26. Among the foods Miss Curry will teach her men students to prepare will be corned beef and cabbage, steak and French-fried potatoes, fish fry, roasts, stews and boiled dinners.

SPURNS GAS MASK

The story was reported in London of an elderly housewife spurning an offer of a gas mask and telling the air warden: "I don't want to have anything to do with those things; they cost too much to run."

Assured that the gas mask would cost her nothing, the suspicious housewife retorted: "That's what the man who sold me my gas stove said."

Your Association—

What It Is *and* What It Offers

VIII

FOR a long period of years the technical men in the gas industry have upheld a splendid tradition of progress in the industry. They have carried on painstaking studies and research and many of their contributions have materially altered gas manufacturing and distributing practice in this country. The result of this constant search for operating economies has been that today the technique of gas production and distribution is vastly superior to what it was in years past. Many of these developments have been wrought within the framework of the Technical Section of the Association.

Hugh W. Hartman, who is secretary of the Accounting and Technical Sections in addition to being assistant manager of the Association, has the distinction of being the oldest staff member in point of service. In fact, his work with a national gas association antedates the organization of the American Gas Association. He was employed as assistant secretary of the old American Gas Institute, which in 1918, combined with the National Commercial Gas Association to form the American Gas Association.

Hugh W. Hartman

Educated in the public schools of Chicago, Illinois, and Kent College of Law, Mr. Hartman immediately became affiliated with the gas industry. His first position was in the collection department of The Peoples Gas Light and Coke Company, Chicago, in 1906. In 1908 he became secretary to the engineer of distribution and, in 1910, was made secretary to the chief engineer of the same company.

His work in a national trade association began in 1915 when he was appointed assistant secretary of the American Gas Institute. He continued with the Institute until the organization of the American Gas Association in 1918 when he was appointed secretary of the Technical Section of the newly formed association. He was appointed secretary of the Accounting Section in 1919. He advanced to the position of assistant secretary-manager in 1925, yet retaining the secretaryship of the Accounting and Technical Sections. This title has since been changed to assistant manager.

The Technical Section has jurisdiction over all Association activities relating to the production and distribution of gas and its by-products. Reports and findings dealing with the section's activities are the composite result of diverse scientific research and studies, as well as the practical experience and long-time observations of operating practice among gas companies and manufacturers throughout the United States.

As provided in the Constitution of the Association, the section is organized along similar lines to other sections. It is headed by a chairman and vice-chairman who are elected annually by the individual members of the section. The chairman is a sectional vice-president of the Association and an ex-officio member of the Executive Board. There is also a managing committee which supervises the activities. This executive group, which includes representatives of all affiliated associations, is assisted in larger matters of policy by an advisory committee. The latter considers all recommendations for research. The section secretary is a member of A. G. A. headquarters' staff and it is his duty to coordinate, direct and report the section's activities.

Work of the section is centered in three major committees covering the chemical, distribution and gas production fields. It is the function of these committees to initiate the activities in their respective fields through the assignment of problems, the appointment of subcommittees, the securing of papers both for conferences and the annual convention, and the appointment of sponsors on subjects which do not warrant committee structure. The function of a sponsor is to keep in active touch with any developments in the field assigned to him and to advise the committee of any action which might be desirable in the form of an article for the MONTHLY, a paper at one of the conferences or the annual convention or the formation of a subcommittee. It has been the intention by such an organization to assure the members of the presentation of all developments in the field with a minimum demand upon the time and expenditures of the member companies.

Activities of the committees might be divided roughly into two general types. First there is the supervision of original research work carried on at the expense of the Association by men employed for that purpose. This involves the expenditure of funds of the Association and is planned to cover only such developments as would benefit the industry as a whole and only such research work as would not be done otherwise. The research activities in connection with mixed gas, pipe coatings and corrosion problems, cast iron pipe joints and welded steel joints are characteristic of this type of function.

The second type is the voluntary cooperation of members in the preparation and presentation of experience and studies of individual members in the form of reports, papers and discussions toward the end that all may benefit from the efforts of each. This type of activity constitutes the largest portion of the committee work and is unquestionably one of the most valuable functions of the organization.

While reports of committees are made annually at the convention and a comprehensive program is presented there, a large number of important activities are covered at the annual Distribution and Production and Chemical Conferences. These were originated due to the feeling of the tech-

nical men that insufficient time was permitted at the convention for adequate discussion of their specific problems. These conferences also enable the young junior engineers, who are unable to attend the convention, to participate in a free discussion of the work in which they are primarily interested. The conferences are from two to three days' duration and their programs are a composite presentation of the committee reports not discussed at the convention and papers on outstanding problems in the individual fields. Since members who have developed apparently successful solutions or procedures are requested to present them at these meetings, the programs represent a fair cross-section of the problems confronting the industry.

Corrosion Study

A typical example of the type of work undertaken by the section is that on pipe coatings and corrosion. In 1928 the importance of the losses occasioned by the gas industry through pipe corrosion was recognized and a program was inaugurated with the purpose of accumulating reliable data on the behavior and performance of the various pipe coatings then on the market. Since that time reports by the research associate on field and laboratory coating tests, corrosion surveys, pipe-line inspections, cathodic protection, and other phases of the work have been published in various journals or presented at Association meetings. The data thus accumulated have been invaluable to the industry.

The material gathered in the study of pipe coatings and corrosion has been assembled and arranged in a manual just published by the Association. This manual emphasizes the economics of pipe coating and also contains discussions of corrosion surveys and soil testing, pipe coatings, and methods of applying coatings, methods for inspecting pipe lines and coatings, laboratory testing methods and other related material.

Much important work, in addition to the pipe coatings and corrosion research has been accomplished in the field of distribution. This division has been most concerned with the design of distribution systems so as to reduce to a minimum the extreme investment and operating costs involved and the various problems introduced by the tendency to increase the pressure in congested areas to avoid the necessity of laying additional mains under streets already overcrowded with underground structures. This has manifested itself mostly in the research on pipe joints, leading to the development of the mechanical joint, the introduction of steel pipe in connection with higher pressures, and the coincident necessity of research to insure greater length of life of such pipe in the ground and the avoiding of increased percentages of unaccounted-for gas and leakage.

Pipe Joint Research

For a number of years research on pipe joints was conducted at the A. G. A. Testing Laboratories under the supervision of a subcommittee of the Distribution Committee. Though the prime purpose of this program was to determine the effectiveness of the pipe joints then on the market, it has resulted in substantial improvements in the design of pipe joints for cast iron pipes and bell joint clamps. The development of testing procedure and equipment alone was a forward step.

An important phase of the section's work is devoted to metering. Present problems of measurement are vastly different from those of other years. These changes are due to changes in gas conditions and changes in load factors, or in the types of loads that have been acquired. Accuracy of meters under widely varying conditions has been the objective of many studies and reports of the Association. Progress in this direction has paid dividends in better customer relations and decreased operating expense.

An examination of the A. G. A. Proceedings will indicate that the production of gas during the last dozen years has had one major problem; namely a constant adjustment in plant operation due to the increasing availability of purchased gas either in the form of natural gas, coke oven gas, oil refinery gas or other types of gas. This problem has been one of balancing the various products so that a uniform supply would be available with safety, economy and adaptibility to the various utilization appliances. One of the greatest efforts of the section along this line was the research on mixed gas.

The Committee on Mixed Gas completed its assignment in 1932 after six years of research. All experimental work with the exception of that in connection with several field tests was conducted at the A. G. A. Testing Laboratories. During the course of the extensive investigation in excess of 175,000 separate tests and examinations were concluded involving the preparation and study of more than 250 different gases, resulting in the collection of a large amount of test data. This material was made available to the industry in three separate bulletins totaling about 200 pages in all and has been of great benefit to many companies throughout the country.

Survey of Coals

An undertaking of great value has been the survey of gas and coke-making properties of American coals. After eight years collaboration with the Bureau of Mines, a monograph was published giving extensive carbonizing information on 30 American coals. This information had never before been available and is considered an outstanding contribution of the section.

In the field of water gas production, a committee has reported on over thirty related subjects over a period of years. These include: bituminous coal, heavy oil, oil gas, high B.t.u. gas, liquefied petroleum gases, reforming of gases, mixing of gases, refractories, waste heat boilers, tar emulsions, special methods such as backrun process, Chrisman cycle, reversed air blast, refractory screen process and low gravity gas, automatic grates, use of oxygen and Water Gas Test Code. One important study has been concerned with the modification of plant operation necessitated in order to accommodate existing equipment to the increased use of natural gas in many large cities. Much of the work undertaken has been well rounded out and authoritative reports has been published in the A. G. A. Proceedings.

One phase of the section's activities has been the compilation each year of reports from builders of gas plants

and equipment. These reports have described new plant installations and have pointed out various new developments in gas manufacturing equipment and processes.

Coal carbonization has been the subject of many reports of the Technical Section. The following phases of this field have received attention: the admixture of coke breeze with coal before carbonization, preparation, sizing and marketing of coke, low temperature carbonization, complete gasification of coal, gas producers, standard test code for carbonizing plants, dry quenching of coal, B.t.u. control of coal gas and mixed gas, and use of oxygen in connection with processes for complete gasification of coal. In connection with the standard test code for carbonizing plants, actual plant tests were conducted on four different types of carbonizing units and complete heat and material balances were published.

Chemical Reports

The chemical committees have devoted themselves largely to reports on laboratory practice, analyses and tests, and chemical control of gas production. Many valuable reports have been made on such subjects as the gum problem in its various phases, determination of fog content of gas, unit processes in chemical engineering, purification, dust problem, hydrocarbon hydrates, meter diaphragm deterioration and meter diaphragm dressings. Revision of the Gas Chemist's Handbook has been a vital part of this committee's program.

Each year the author of the best technical paper presented at Association meetings is recognized by the award of the Beal Medal. Established in 1897 by the family of the late W. R. Beal, the award is highly prized by technical men throughout the industry.

In addition to the activities described above, all Technical Section committees act as a clearing house for questions submitted by members throughout the year and a considerable amount of data is disseminated in this way. A close liaison is maintained with A. Gordon King, headquarters' service engineer who handles technical inquiries received by the Association and who maintains contact with other engineering associations, the American Standards Association, and other organizations. Groups of Technical Section men are also appointed on special cooperating committees with other engineering associations. A specific instance is the Subcommittee of the Distribution Committee appointed this year to cooperate with the American Road Builders' Association on underground structures.

While it is obvious that any brief account of the section's work will overlook many activities, it is a fact that the talent and experience of many trained minds are constantly being utilized for the advancement of the industry.

Gas Featured in National Magazine Articles

"GAS MARCHES ON"—and in the pages of the national magazines, too, as witness the illustrated articles appearing in the *Ladies' Home Journal, Better Homes and Gardens, Pictorial Review,* and *The American Consumer.* This is the kind of publicity that makes one glad to be in the gas business. The combined circulation of the above magazines is in excess of 7,500,000 copies.

Pages 87 and 88 of the *Ladies' Home Journal* for October carry an article, highly complimentary in character, describing the gas industry's national competition for architects. The author is John Cushman Fistere, architectural editor of the Journal. The illustrations accompanying the article reproduce the prize-winning plans submitted for a $7,500 house by John Stenken.

The September issue of *Better Homes and Gardens* features on page 54 an excellent article on the new CP gas ranges, under the title, "The Sign of Thrift." Another strong article on CP ranges appears on page 49 of the October issue of *Pictorial Review,* the title being "Gas Ranges Win a Diploma." Both articles are fully illustrated and are lavish in their praise of the latest developments to be found in CP gas ranges and what these developments mean to the women of America. Reprints of the articles have been made available by the Committee to Conduct National Advertising.

The American Consumer, a magazine devoted to the interests of the consumer-buyer, on pages 13 and 14 of its August issue, published an illustrated article entitled "Buy a Gas Range You Can Afford." The article sets forth various features which the potential buyer should keep in mind. All of the most recent developments to be found on CP gas ranges are given detailed treatment in the article.

Other national magazine articles are in course of preparation. A particularly valuable one will appear in the November issue of *Better Homes and Gardens.* It will deal with choice of color in the kitchen and the author is Harry Swenson, The Peoples Gas Light & Coke Company, Chicago, Ill. Reprints of this article will be made available later by *Better Homes and Gardens.*

"Carefree" Gas Kitchen

Not only did the Providence Gas Company, Providence, R. I., tie in with the new Fred Astaire-Ginger Rogers picture, "Carefree," at the local theatre, as shown above, but large five-column ads in newspapers announced a "Carefree Special for Your Kitchen." The offer included a deluxe gas range and a gas refrigerator at a special low price. The ads featured large pictures of Fred Astaire and Ginger Rogers dancing and a sketch of a model gas kitchen. J. L. Johnson is sales manager of the Providence company

Mystery Chef Gets CP Sales Leads

THE Mystery Chef reports that he has received from 700 to 800 requests for detailed information on the Certified Performance gas range as a result of his broadcasts starting with Tuesday, August 16. Among the total requests received are a substantial number of sales leads. These have been forwarded to local gas companies with the suggestion that contacts be established with the writers of the letters.

30 California Employees Retire Under Uniform Pension Plan

CHARLES L. WHITEHILL, secretary of the Southern California Gas Company since 1926, retired on September 1. He is succeeded by F. E. Seaver, assistant secretary of the company and former secretary of the Los Angeles Gas and Electric Corporation.

Whitehill has been in the service of the Southern California Gas Company for 18 years, going there in 1920 from Kansas City, Missouri, where he held the position of auditor in the Kansas City Gas Company. The combined record of his service here and in Kansas City totals 43 years.

Another prominent member of the gas industry in Southern California who retired on the same day as Whitehill is Henry C. McAllister, manager of Southern California Gas Company's eastern division, with headquarters at San Bernardino. Mr. McAllister has been a member of the Southern California Gas Company's service organization since August, 1909, coming into the company in the capacity of eastern division manager on the purchase of a predecessor company. W. P. Hand, assistant division manager prior to September 1, has been appointed to fill McAllister's position.

The retirement of these two men, together with 28 other Southern California Gas employees, on September 1, marks the greatest number of people who have ever been retired under the company's uniform pension and benefit plan at any one time. Oldest in point of service among these is James Walter Bergen, who completed his thirtieth year of service on June 15, 1938. He retired as a member of the company's sales department. Two other men with long service records retired also from the sales department: Robert B. Moore, dealer representative in the Pasadena district, who has been with the company 25 years; and Charles N. Robert, assistant industrial sales manager, a 24-year man.

Robert pioneered in commercial and industrial gas sales in Los Angeles, selling the first gas furnace installed there, and introducing heavy duty gas equipment for restaurants. One of his most outstanding contributions to industrial gas usage was the introduction of gas for test firing of locomotives in railroad round houses.

Southern Counties Gas Company also retired 5 members of its organization on the first of September.

Unit Heater Report Gives Sales Aids

THE Non-Residential Heating Committee of the Commercial Section has just completed a special publication on Gas-Fired Unit Heaters outlining engineering methods of unit heater installations. The publication is of attractive form so that salesmen may utilize the pamphlet in visits to prospects. The pamphlet covers five important factors in promoting the sale of gas-fired unit heaters, as follows:

1. General discussion of the advantages of unit heaters
2. Analysis of unit heater prospects
3. Sales engineering procedures
4. Factors in the proper application of unit heaters
5. Installation considerations

The pamphlet contains numerous diagrams of the application of unit heaters to a variety of premises and incorporates the best practices of companies which have been aggressive in this field.

The report was prepared by B. A. Johnson, chairman of the special subcommittee on this subject, with the assistance of ten other members of the Non-Residential Heating Committee, representing gas companies and unit heater manufacturers. Copies are available at 25¢ each.

Dealer Business Near 7 Million in 9 Yrs.

IN the nine years since The Brooklyn Union Gas Company started dealer cooperation in appliance selling, dealer business has amounted to $6,825,468. Of this total, dealer sales have accounted for $5,423,015 and sales through dealer leads have amounted to $1,402,452.

Starting from scratch at the beginning of July, 1929, dealer appliance business is now in the million-dollar-a-year class, aggregating $1,119,533 for the year ending June 30, 1938.

Manufacturers To Meet in Atlantic City

LEADING manufacturers of the gas industry met in New York, Sept. 7, at the special meeting of the board of directors of the Association of Gas Appliance and Equipment Manufacturers. Merrill N. Davis, executive vice-president of the S. R. Dresser Manufacturing Co., Bradford, Pa., and president of the Association, presided.

Because of the New York 1939 World's Fair, it was voted that next year's annual convention of the Association take place in New York. The time was temporarily set for the latter part of May, 1939.

Reports were presented on the numerous sales promotion projects which the Association is now conducting. W. E. Derwent, chairman of the Association's domestic gas range division and vice-president of the George D. Roper Corp., of Rockford, Ill., reporting on the new Certified Performance Gas Range Program said: "This program is gaining the most rapid momentum ever experienced in the launching of a new product to American homemakers."

The third annual meeting of the Association will take place in Atlantic City at the Hotel Claridge on Monday, October 10. The principal event at the gathering of the gas industry's manufacturers will be the election of the new officers and members of its board of directors for the fiscal year 1938-39. In addition to the main general session there will also be meetings of the Association's various divisions. These in turn will hold elections of officers for their respective groups.

A New Idea in Broadcasting

Consolidated Edison Co. of N. Y., Inc., presents this all-employee chorus on its new radio show, "Around the World in New York," which had its premier on WJZ, Tuesday, Sept. 20, from 7:30 to 8 P.M. The chorus reflects the wide range of employee jobs in a big utility, as it includes clerks, accountants, draftsmen, a shop foreman and a sub-station operator

Personal and Otherwise

Barnett and Hall Get New Posts

R. G. Barnett

ELECTION of R. G. Barnett to the position of vice-president and general manager and advancement of E. L. Hall, operating manager, to vice-president and chief engineer, of Portland Gas & Coke Company, Portland, Oregon, was announced August 30 by Paul B. McKee, president.

A California native son, Mr. Barnett entered the gas business 17 years ago with the Pacific Gas & Electric Company. From that company he went to the Coast Counties Gas & Electric Company, which he served as manager. Most recently he was a director of the Emprezas Electricas Brasileiras in Brazil.

E. L. Hall

For the past 32 years, Mr. Hall has been with Portland Gas & Coke Company. He has had an important part in the development of the company's important by-product business and in the working out of new and improved methods of manufacturing gas.

Wins McCarter Medal

PHILLIP SIRAGUSA, a meter reader employed by The Peoples Gas Light and Coke Co., Chicago, for the past 17 years, was singularly honored recently with the award of a McCarter Medal for saving life by the Schafer prone pressure method of resuscitation. The act for which Mr. Siragusa received this national recognition took place last March 15. On that day he applied artificial respiration to a person overcome by gas and was successful in reviving the patient.

Presentation of the medal was made June 7 by James G. Waddick, superintendent of the meter reading department, at a departmental safety meeting attended by 75 associate employees.

The award was made by the Accident Prevention Committee of the American Gas Association.

Gas industry leaders are shown with Grover Whalen, president of the New York World's Fair Corporation, discussing the industry's exhibit at the Fair. The Gas Industry Building, featuring a "Court of Flame," will be inclosed by four 90-foot pylons, suggestive of the grid points above the burner of a gas range. In the picture are, left to right: Conrad N. Lauer, vice-president, American Gas Association; Hugh H. Cuthrell, president of Gas Exhibits, Inc.; Mr. Whalen; N. C. McGowen, president, American Gas Association; Merrill N. Davis, president, Association of Gas Appliance and Equipment Manufacturers

United Light & Power Elects Shoemaker

G. T. SHOEMAKER has been elected vice-president and general manager of the United Light & Power Co., Chicago, Ill., succeeding Burt J. Denman, who died June 25. Mr. Shoemaker was promoted from the position of assistant general manager.

Born at Geneva, Ind., in 1886, Mr. Shoemaker attended the public schools there and received his B.S. in electrical engineering from Purdue University in 1910, and his E.E. in 1916. He was a student apprentice of the General Electric Co., Fort Wayne, Ind., in 1910-11, and in charge of general design with the Grand Rapids Motor Truck Co. the following two years.

Mr. Shoemaker joined the United Light and Power Co. in 1913 as draftsman, became electrical and mechanical engineer, and rose to assistant to Mr. Denman. He has been in charge of all engineering and construction work done for subsidiary operating companies, and in his new position will head all operations of subsidiaries.

Gets Home Economics Teaching Post

DR. EARL C. McCRACKEN has been appointed assistant professor of Household Engineering at Teachers' College, Columbia University, following the retirement of Dr. C. J. Lynde. For a period of ten years, this course in Household Engineering has included detailed study on domestic gas equipment. The Consolidated Edison Company of New York has cooperated in the laboratory work of this course through the services of T. H. Schleuning.

Dr. McCracken formerly was an instructor in Physics at Iowa State College. His plan for the program at Teachers' College includes an elementary course adaptable to Home Economics students, a course in advanced technique and laboratory problems for advanced students, and a research program in equipment.

Nominated for Commercial Section Office

Davis M. DeBard

DAVIS M. DEBARD, vice-president of Stone and Webster Service Corporation, New York, has been nominated to serve as vice-chairman of the Commercial Section of the American Gas Association for 1938-39. The nomination was made by the section's Nominating Committee headed by F. M. Banks, of the Southern California Gas Co., Los Angeles. Election of officers will be held at a meeting of the section, October 11, during the Association's annual convention in Atlantic City, N. J.

Mr. DeBard is widely known, both here and abroad, for his intimate knowledge and intensive studies of sales methods.

Affiliated Association Activities

Pacific Coast Gas Association

H. L. Farrar

MEETING at the beautiful Santa Barbara Biltmore Hotel in California, Sept. 14-16, the annual convention of the Pacific Coast Gas Association attracted more than 600 delegates from all parts of the country. It was considered one of the most successful conventions ever sponsored by the Association. Many valuable reports and addresses featured the three-day conclave. Norman R. McKee, vice-president of the Southern Counties Gas Company, and retiring president of the Association, conducted the general sessions.

H. L. Farrar, president of Coast Counties Gas and Electric Co., was elected president for the 1938-39 term. Other officers elected at the meeting are: vice-president, A. E. Holloway, vice-president in charge of sales, San Diego Consolidated Gas & Electric Co.; treasurer, D. G. Martin, general auditor, Pacific Gas & Electric Co.

New directors are: R. G. Logue, vice-president, Ward Heater Co.; J. J. Winn, Jr., commercial manager, Portland Gas and Coke Co.; R. E. Easton, president and general manager, Santa Maria Gas Co.; W. R. Smith, Continental Water Heater Co., Ltd. Robert A. Hornby was elected a director to fill the unexpired term of Addison B. Day. Retiring President McKee automatically becomes a member of the board of directors.

Among the prominent speakers at the convention were N. C. McGowen, president of the American Gas Association, and R. M. Conner, director of the A. G. A. Testing Laboratories.

Mid-West Gas Association

THE eighteenth annual Gas School and Conference, sponsored jointly by the Mid-West Gas Association and the Extension Division of Iowa State College, will be held at Ames, Iowa, November 14-16. The program will cover a variety of subjects related to gas distribution and production. Approximately 150 representatives of gas companies in the middle western states are expected to attend, it is estimated by R. B. Searing, secretary-treasurer of the Association.

F. J. Gunther, assistant general manager, Iowa-Nebraska Light and Power Co., Lincoln, is general chairman and C. B. Dushane, Jr., assistant manager, American Meter Co., Chicago, is general vice-chairman. The committee organization includes the following chairmen: Arrangements Committee, Prof. L. W. Mahone, Iowa State College; Meter Committee, A. L. Fritchey, Pittsburgh Equitable Meter Co.; Distribution Committee, L. J. Eck, Minneapolis Gas Light Co.; Utilization Committee, Ed. Kennedy, Iowa-Nebraska Light & Power Co.; Production Committee, E. M. Raun, Sioux City Gas & Electric Company.

Empire State Gas and Electric Association

E. P. Prezzano

ONE hundred and fifty executives and department heads of the various gas and electric utilities in New York State met at the thirty-third annual convention of the Empire State Gas and Electric Association at Lake Placid Club on September 15 and 16.

Edward P. Prezzano, president of the Westchester Lighting Company, who a few days before had been elected president of the Association, presided at the second session of the meeting with Joseph P. Haftenkamp, vice-president of the Rochester Gas and Electric Corporation, retiring president of the Association, presiding at the first session. Other officers of the Association elected were: vice-president, Irving K. Peck, president, Binghamton Gas Works; treasurer, Herbert C. Davidson, vice-president, Consolidated Edison Co. of New York, Inc.

Mr. Haftenkamp opened the convention with a splendid talk on the importance of continued executive interest in Association affairs.

A. G. A. Officials Speak

Alexander Forward, managing director, American Gas Association, spoke for N. C. McGowen, the Association's President who was unable to be present. He outlined the advertising, sales and research programs of the American Gas Association and spoke on the importance of coordination of effort.

Walter C. Beckjord, vice-president, Columbia Gas and Electric Corporation, spoke on the "Gas Industry in Prospect and Retrospect." He outlined in detail the many successful efforts in sales programs and the market possibilities of the gas industry upon which its future will depend.

Col. John Stilwell, vice-president, Consolidated Edison Company of New York, Inc., gave a splendid talk on the position of the gas and electric industry in regard to their accident records. He made a strong plea for improvement of the record.

Francis J. Brett, vice-president and comptroller, Niagara Hudson Power Corp., gave an inspiring address on accounting problems related to the adoption of the new uniform system of accounts. The importance

Convention Calendar

OCTOBER

3-6 American Transit Association
Royal York Hotel, Toronto, Ont.

10 Association of Gas Appliance and Equipment Manufacturers
Hotel Claridge, Atlantic City, N. J.

10-13 American Gas Association
Atlantic City, N. J.

10-14 National Safety Council
Stevens Hotel, Chicago, Ill.

17-21 National Metal Congress and Exposition*
Detroit, Mich.

24-28 National Hotel Exposition*
Grand Central Palace, New York, N. Y.

NOVEMBER

1-2 The Institution of Gas Engineers
London, England

Wk. 13 National Association of Railroad and Utilities Commissioners
Roosevelt Hotel, New Orleans, La.

14-18 American Petroleum Institute
Stevens Hotel, Chicago, Ill.

DECEMBER

4-9 Exposition of Chemical Industries
Grand Central Palace, New York, N. Y.

4-9 American Society of Mechanical Engineers
Philadelphia, Pa.

5-10 National Exposition of Power and Mechanical Engineering*
Grand Central Palace, New York, N. Y.

* Includes exhibit sponsored by A. G. A. Industrial Gas Section.

of uniform interpretation and a plan for a cooperative solution of accounting problems were outlined by the speaker.

Hon. Milo R. Maltbie, chairman of the Department of Public Service, gave a most interesting extemporaneous talk on some of the problems of regulation.

Other speakers included E. H. Thomson, president of the Federal Land Bank of Springfield; C. W. Kellogg, president, Edison Electric Institute; and Hon. Morris S. Tremaine, comptroller of New York State.

Floyd L. Carlisle, chairman of the board, Consolidated Edison Co. of New York, Inc., closed the convention with an inspiring address on the business outlook.

Gas Conservation Article

UNDER the heading "Gas That Goes Back to Work," Reader's Digest magazine for September, 1938, carries an article which describes the method of putting natural gas back into producing horizons to maintain pressures and serve as storage for future needs. Condensed from an article by Robert Littell originally carried in the Baltimore Sunday Sun the article mentions among other experiments a major pressure maintenance project in the Cook Ranch Pool in Shackleford County, Texas.

Meter Fellowship Established at Mellon Institute

Dr. R. L. Wakeman

DR. E. R. WEIDLEIN, director of Mellon Institute, Pittsburgh, Pa., has announced the establishment of an Industrial Fellowship on meter technology by the Pittsburgh Equitable Meter Company.

Among the first projects to be investigated is the development of a satisfactory substitute for the present leather diaphragms used in gas meters. Modern research developments have led to the production of synthetic resins of a wide variety of useful properties which are to be considered for application to this problem. The gas industry itself might be called upon to supply the raw products from which to manufacture materials of construction for its meters.

Dr. R. L. Wakeman is to be the incumbent of this Fellowship. He was trained at Massachusetts Institute of Technology, from which institution he received the degree of Ph.D. in 1930. After two years of post-doctorate study at Paris and Zurich he held a position in industry until he joined the research staff of the Institute in 1935. Dr. Wakeman, in addition to his broad training and experience in various fields of chemistry, is an authority on synthetic resins and plastics.

In commenting on the Meter Fellowship, Colonel W. R. Rockwell, president of the Pittsburgh Equitable Meter Company, stated: "The scientific and technological problems involved in producing something better sometimes require intense research by scientists who can devote their entire time and energy to solution in a manner which cannot be expected from laboratories dealing with daily practical problems."

Death Ends 66-Year Service Record

Edward Olsen

EDWARD OLSEN, meter superintendent of the Citizens Gas and Coke Utility, whose record of 66 years of continuous service with the Indianapolis utility is believed to be the longest in the gas industry, died August 20 at the age of 85. He was still active at the time of his death.

Born in Denmark in 1853, Mr. Olsen emigrated to this country as a youth of 19 and promptly obtained employment in the remodeling of the Indianapolis gas plant. In 1875, he was assigned to reading and setting meters and in this work often traveled long distances on foot carrying four meters, two on a strap which hung around his neck and two in his hands.

In addition to these duties, he personally answered all fire alarms and was invariably called when there was a break in the mains, trouble at the plant, a sick horse, or someone was overcome by gas. As the company grew larger, his entire time was devoted to meter work, handling complaints and other details of customer service.

During his extraordinary career with the utility, Mr. Olsen served under five different managers and witnessed an increase in the number of meters served from 3,000 to the present 85,000. Because of his wide experience and extreme consideration for the welfare of his men, he was familiarly known as "Pop" to everyone from the general manager to the lowliest employee.

A Clearing House for Standards

STANDARDIZATION is today one of the most important and appreciated activities of trade associations and technical societies. That this is particularly true of the American Gas Association is readily apparent from a review of its national program of testing and certification of gas appliances and its representation on many technical committees of the American Standards Association. The A. G. A. is a member of the latter association and, in fact, most of its appliance standards have been approved and issued as American Standard. Dana Barnum, present A.S.A. president, is a representative of the gas industry, being formerly president of Boston Consolidated Gas Company.

The pioneering or first steps in standardization are naturally carried on by the industry or by the technical group most concerned with the subject. Many standards, however, have a significance for more than one industry or group, and the second step follows naturally—to bring the work into the American Standards Association for the development of national standards.

The American Standards Association plays the important role of national clearing house for the activities of the many groups engaged in standardization. At present more than 600 national organizations are cooperating in the work of the A.S.A., and of these fully three-fourths are trade associations or technical societies.

In developing a national standard, fundamental differences in point of view and in type of organization sometimes lead to controversies. One of the most useful services which the A.S.A. performs is in supplying the type of forum which leads most easily to the solution of controversies between these national groups.

Approval by the American Standards Association, requiring a 90 per cent affirmative letter ballot vote of the representatives of some forty national bodies on the Standards Council, brings with it acceptance by a large number of groups that otherwise might not have had contact with the standard, broadening the use of the standard and increasing its effectiveness.

This clearing-house function, far from duplicating any service of trade associations, has led to the unification of the work of scores of industries and has resulted in the saving of very considerable sums. For this reason trade associations are making increasing use of the facilities of the A.S.A.

Gas Broiling

The Welsbach Hotzone gas broiler-griddle is being currently advertised to the restaurant trade as broiling with "infrared rays with charcoal results." We like the idea of pointing out that gas can broil as well as charcoal can.

Commercial Section

Hugh Cuthrell, Chairman J. W. West, Jr., Secretary F. X. Mettenet, Vice-Chairman

Home Service Can Keep Gas Customers

By MRS. BEATRICE STREGE

Home Service Director, Seattle Gas Co., Seattle, Wash.

HOME Service work can be a real sales promoting activity when it is a part of *the united front* of the sales program.

Let me explain. Too often, the home service department of a public utility is regarded as a necessary evil—one of the things that a public utility must have—but a department which does not pay for itself in sales directly or indirectly.

That's all wrong. The girls in the home service department of a public utility can and do pay their way in sales created directly and indirectly by their work. They develop leads. They uncover possible customer losses through their talks with customers. They develop sales strategy by their talks with women customers which can be made the basis of the sales story of the sales department. *They can keep customers.*

Constant Selling Necessary

We all know what real competition the electric companies offer. How easily we can lose customers to them. How hard it is to gain new customers, to take customers away from them.

And we realize that we have to keep everlastingly selling the present customers on the advantages of gas for cooking; and telling future customers why they should use gas for cooking—if we are to keep up with the parade.

That's why I say that the home service department has a part, and an important part, in the united front of the sales program of public utilities. We are constantly creating new ways of interesting women in cooking, new excuses—if you will—for telling our story. And the woman who has seen a gas cookery demonstration either in her own home or at a cooking matinee or school, is not going to fall so quickly for the alluring story of electric ranges which, as this month's advertising states, cost "only one-half as much as you think."

In Seattle, this year, some rather novel ideas have been used by home economists to tell the cooking story to Seattle women. Many of these which offer particular opportunities for selling gas are worth describing because they are things which may be repeated everywhere.

In addition to the usual demonstrations to which salesmen bring difficult-to-sell customers and the club luncheons which we prepare for club women—and charge a small price—and at which we talk briefly on the advantages of gas cookery, several special cooking schools have proved big attractions and good business getters.

One of the most successful cooking schools held this year was the Brides' School held in cooperation with the Seattle *Times*. Girls who planned to be married during May, June, July and August of this year were invited to register for the Brides' School, giving their name, address, wedding date and fiance's name. More than five hundred brides-to-be registered and shower gifts were prepared for each and distributed at the school. These gifts were composed of advertising cookbooks from each of the co-sponsors of the school and a certificate for a miniature photograph of the bride from a photographer. The cooking demonstrations featured meals for two, and the advantages of gas cookery were, of course, stressed throughout the school.

Prospect File Swelled

The registration feature for this school was especially important, since it supplied an excellent prospect list of young men and women interested in buying. We felt it particularly good, since every one of these couples who purchased a gas range was almost sure to be a customer for a long time. This is a good example of how the sales department's activities can be aided by an up-and-coming home service department.

We've paid a great deal of attention to young married women, older married women and many other groups of housewives. But have you ever stopped to think how many business girls, married or unmarried are logical prospects for gas ranges? Good prospects, too, because many of them have their own homes. Others support their families and have a good deal to say in family purchases. We realized this year that we should be reaching this group more directly, and also that our regular cooking schools and demonstrations were seldom, if ever, attended by this group of women.

So, we put on a business girl's school, called "Food Shortcuts for Business Women." The basic idea of the school was to demonstrate meals which are quick and simple to prepare, yet attractive enough to be used for company meals when the business woman entertains. Naturally the story of speedy gas cookery fitted admirably into this picture.

The school was one of the most popular and successful promotions ever held in Seattle. Although originally it had been intended to hold the schools once a week for four weeks, in the Gas Company auditorium, it was found that the capacity there was only half what was needed. We planned for 350 and 700 came to the first meeting and more were turned away. It was necessary to rent a downtown theater for the remainder of the school.

The classes were held in the evening, of course, and simple table settings and flower arrangements were included on the program as well as the demonstration of shortcuts and simplified methods of cookery. For example—we demonstrated a company breakfast menu, a 3-minute dinner menu, grilled breakfasts, movable meals, top-of-stove, broiled, and oven dinners and other quick meals. At the final session, members of the group competed for prizes in three interesting menu contests. The prize winner of the company breakfast menu contest, the buffet supper contest and the thirty-minute dinner contest prepared her menu and arranged her table on the stage. A sweepstakes prize went to the woman whose demonstration was judged the best.

This promotion reached an entirely new group of women who can seldom if ever attend cooking schools. Plans are under way to conduct a similar series of demonstrations this year, with attendance limited by registration. The registration will, of course, give us a fertile list of prospects to turn over to the sales department.

Men's Cooking School

This year another promotion was held which reached another new group and stimulated a great deal of interest. This school was a Cooking School for Men Only. Through the columns of a Seattle paper, men readers were invited to send in their favorite recipes. More than a thousand recipes were entered and of these, 125 were selected for printing in a permanent book.

The Cooking School for Men Only had as its slogan, "The World's Greatest Cooks Wear Pants" and eight prominent men about town who had contributed prize winning recipes to the cook book were invited to prove this point by preparing their favorite recipe on the stage. The owner of a sporting goods store broiled a venison steak, another well-known sportsman made

Paper presented at Pacific Coast Gas Association Conventions, Santa Barbara, Calif., Sept. 14-16, 1938.

biscuits in a flour sack, the popular coach of the University of Washington baseball team baked a delicious angel food cake. The president of the City Council collaborated with a newspaperman to make Italian spaghetti, etc. At this unique school men did all the cooking. The tremendously interested audience, composed entirely of men, swapped recipes and spent an enjoyable as well as a profitable evening.

It is planned to make this promotion a regular feature at the start of the hunting and fishing seasons.

The sales department, I am sure, can well appreciate how important it is to have the husband sold on a range when wifey says, "George, we've got to have a new range." How nice, then if George says, "Well, let's get one of those new gas ranges. You know—when I went to the cooking school for men only . . . . etc."! You have a salesman at hand, doing part of your selling for you.

There's another group of coming customers whom we must not forget—and they're our hope of the future. The children!

Children's Cooking School

This year, as a part of our radio program we have put on a children's cooking school. The school, held each Saturday morning in the radio home economics kitchen is attended by Camp Fire Girl groups who earn their cooking honors in this class. Part of the program is broadcast, with one ten-year-old girl interviewing other girls on their favorite hobbies.

The climax of the school this spring was a cake-baking contest. Children whose cakes were chosen as winners baked them in front of the audience to compete for the grand prize—a GAS Range. The parents of this child purchased a gas furnace and refrigerator and are in the market for a gas water heater—which proves that immediate sales as well as future sales may result by teaching gas cookery to children. One hundred and sixty-five girls entered cakes in the contest.

And—though you may not think so at first glance—it doesn't pay to neglect the maids who work in better class homes where ranges worth $150 to $500 are used.

We found this out this year in particular and are making every effort to tell our gas cookery story to maids who are new being trained by W.P.A. groups and other groups for expert service.

During the past year our department has made several demonstrations before the W.P.A. maid's classes in which several hundred girls are being trained. Most of them will go into homes which pay upwards of $50 a month for housekeepers, and in many homes they will have the decision to make when a new range is purchased. Naturally, we are making sure that these girls know first hand the advantages of gas cookery. We equipped their practice kitchen with modern gas ranges. When they go to work they will remember how easy and how quick is modern gas cookery.

All these groups—the brides-to-be, the business girls, the men's group, the children and the maids—become definite prospects now or in the future for gas equipment. All will have an influence in the future range purchases of their families and by reaching these groups and acquainting them with the advantages of gas cookery, the home service department of a utility is developing definite business for the sales department.

Other angles which have proven valuable in Seattle for attracting women and securing names of interested prospects are an unusual cooking school built around a famous local cookbook, a prize-recipe cookbook, and a recipe-inspired table setting display.

This spring a recipe contest was held in which women were invited to contribute their favorite recipes for a cookbook which would be distributed throughout the city.

Hundreds of recipes were submitted and the best selected for publication in a cookbook. Names and pictures of the women who contributed the recipes were published with each recipe.

An unusual cooking school was that which featured favorite recipes from a famous Seattle Cookbook—the Fruit and Flower Mission Cookbook. This school was attended by large numbers of society women who are sponsors of the association—a group not always reached by cooking schools, and thus seldom reached directly with our cooking story.

Favorite Recipes Featured

Favorite recipes were featured, and the whole preparation of the recipes was done against a backdrop of a giant reproduction of the cookbook. During the preparation a chalk artist cartooned the steps in the preparation and did a clever chalk-talk afterward for the audience. A part of this school was the preparation of a cake that failed and then the same recipe as a perfect cake. The demonstrator told why the cake had failed and succeeded and gave her audience variations of the perfect cake.

Another school which reached the "society" group was one built around recipe-inspired table settings. It was a five-day display and demonstration held in connection with one of the large department stores of the city, and though it was held during one of the hottest weeks of the summer brought six or seven hundred women into the store each day.

To explain what we mean by "recipe-inspired," I'll tell you about two table settings and demonstrations. The Chinese Supper table was inspired by an authentic Egg Foo Yung recipe and the table was arranged with grass linen mats and Franciscian Pottery with a lovely willow tree design. The flower arrangement on this table was a replica of the willow tree branch. The Bachelor Supper Table was inspired by the Clam Chowder Recipe from the "Let George Do It" prize recipe book of men's recipes. The soup was served in a soup set with marine motif and the flowers were bachelor buttons arranged in a sea shell. At each program the recipe around which the demonstration was built was demonstrated.

A program such as this one is a great assistance in interesting and reaching the "society" group of women who are seldom reached by cooking schools. This group is important, for they're the style leaders of the community. If one of them buys a new gas range and talks it up to her friends the news that gas is smart spreads in ever widening rings from the society group to the folks who never make the society page but who follow to a great extent the leadership of those who do.

They must be reached by clever, planned programs directed especially to them. And that is where the home service department can help the sales department in its united program for the sale of more gas appliances.

Radio Program

One more sidelight on home service. We are all familiar with the excellent work which the Mystery Chef is doing in interesting women in good cooking and in gas appliances. We all know how helpful a radio home service program can be—and it can build and hold an audience. I know most of you men wouldn't listen to one for five minutes. You think they're deadly. But women are interested in them because they tell them how to do their jobs better. It's the same thing as if you turned on a program on how to sell gas appliances. Your wife would probably think is was pretty deadly. But you'd like it.

Well—to fill a need that has long existed for a well-constructed, interesting and informative program addressed especially to Seattle women, a half-hour radio program was created by one of the Seattle stations. This program consists of a daily half-hour radio program and a full-time home service department under the joint supervision of two skilled home economists.

The program is put on from the Central Housing Information Bureau, a cooperative enterprise sponsored jointly by Seattle architects, builders, contractors, home equipment and material dealers. The auditorium from which the program is broadcast is in the Information Bureau and the kitchen in that auditorium is equipped with a gas refrigerator and range.

Each week several hundred women visit that auditorium as guests of the home service directors. Others come seeking information on home building, home remodeling, food problems, gardening, etc. All of them see the new gas equipment there, most of them register as guests and automatically go on the active prospect list. The home service directors who are on duty there all the time, sell gas appliances as the most modern appliances which can be put into the home—but do not give the impression that they are salesmen.

To keep the program interesting many subjects besides cooking and cooking ap-

(Continued on page 367)

1939 Methods for Selling Residential Gas

AS detailed information begins to filter through regarding the new A. G. A. sales training program being prepared by the Commercial Section, it becomes evident that this will be one of the most important activities of 1938-39. The field survey just completed has revealed such considerable changes in selling conditions since the first A. G. A. Domestic Sales Training Course was prepared in 1928, that a completely fresh approach will be taken in the new program. The new course is being given the general title of the Course in "Selling Residential Gas Today."

The emphasis of the course will be put on the methods that have worked in 1938 for outstanding salesmen in selling the benefits of gas service and gas appliances. The outstanding points of the new gas appliances will be presented in the terms that successful salesmen of today actually use in talking to customers. Observation has shown that sales often depend on the impressions gained by customers from apparently unimportant phrases used by the salesman. Consequently a feature is being made in the course of the precise wording that wins the interest and arouses the desire of customers.

Boiled-Down Experience

One executive associated with the preparation of the course made this statement: "If a salesman were given the chance to spend a year in personally studying the methods used by outstanding men in other companies—if he could talk with leading sales managers about the plans and procedures that they find most effective in 1938—if he could study all the modern gas appliances from a selling angle at first hand with the manufacturers and demonstrators—you could be pretty certain that at the end of that time, his sales would benefit in a big way from what he had learned. What we are trying to do in the course is to present precisely that kind of boiled-down experience so that every salesman can take advantage of the accumulated selling knowledge of the industry today."

In addition to discussions of the broader aspects of his job, the salesman will find in the course answers to the down-to-the-ground questions in his mind. Such questions as these are among the hundreds dealt with:

—Which works better today, a service approach or a sales approach in making the first contact with customers?
—What procedure should be used if the prospect will not give you a chance to sell?
—What questions about the old appliances of customers arouse their interest in new appliances most quickly?
—How can the price discussion be postponed until sufficient interest in the appliance is aroused?
—What phrases are most convincing to customers in talking about CP range performance?
—How old should a competitive refrigerator be before a replacement is suggested?
—What is the best method of getting the wife's help in selling the husband?
—In what price range should a salesman begin a salesroom demonstration—with a medium, high, or low-priced appliance?
—How can comparative water-heating and house-heating cost estimates be dramatized for customers?
—How can negative selling be avoided in talking about safety?
—What is the best way of meeting unscrupulous competition?
—What tactics work best with rented-house prospects?
—How can the salesman provide himself with a consistent flow of live leads?

The course will be officially announced to the industry early in October and it is anticipated that most companies will actually begin using it by the end of that month. There is every reason to believe that the industry's sales this winter will reflect the practical value of this new training program.

Course in Sales Cooperation To Be Offered

EARLY next month the Commercial Section of the American Gas Association will break new ground in bringing out a "Course in Sales Cooperation for Everyone in the Gas Industry."

The importance of this activity can hardly be overemphasized. Companies which have enlisted the cooperation of non-selling employees in aiding the sales department have been deeply impressed by the results obtained. However, the plans for securing such cooperation have varied widely and the effects have been somewhat uneven. A demand has been steadily growing for an industry-wide drive to give every company and every employee the benefit of the best methods and tactics. The answer to this demand is the present course, which will be offered at an exceptionally low fee so as to make universal participation possible.

Coming out at the same time as the "Course in Selling Residential Gas Today," shortly to be offered to the sales departments in the gas industry, the new course will provide a rounded program for unifying gas company personnel in the 1938-39 sales drive. The central purpose of this Sales Cooperation Course will be to show all employees how to "sales-slant" both their business and their social contacts with the public, with a view to furnishing the sales department with a steady flow of leads. To use a military metaphor, the salesman's course furnishes the shock troops with extra power at the firing line, while the Sales Cooperation Course has the equally important function of establishing and maintaining a line of constant supply and support.

As a basis for the course, a study is being made of general employee sales cooperation plans not only in the gas industry but in many other industries as well. Out of this study will come an organized body of information which will increase the effectiveness of sales cooperation plans in companies now using them, and will enable companies which have not yet inaugurated such plans to start off on the soundest possible basis.

The official announcement of the Course in Sales Cooperation will go out to the industry early in October. At this stage, however, it can be stated that the course will provide every employee with four kinds of information essential to proper representation of his company in his contacts: (1) detailed knowledge of the *selling* facts about gas; (2) up-to-date information on the new appliances; (3) definite things to say and do when talking to gas users; (4) practical, careful guidance in turning contacts into sales leads.

Present indications are that an enthusiastic response from the great majority of gas companies will result in an increased solidarity and salesmindedness on the part of employees of every description throughout the industry.

West Succeeds Quinlan as Home Bureau Head

FOLLOWING the resignation of John F. Quinlan as director of the American Gas Association's Home Appliance Planning Bureau on October 1, the activities of this Bureau have been assigned to the Commercial Section. J. W. West, Jr., has been appointed director of the Bureau and will continue as secretary of the Commercial Section, with F. W. Williams as assistant to director of the Home Appliance Planning Bureau.

The Bureau's Nationwide Competition for the construction of homes utilizing gas for cooking, refrigeration, water heating and house heating, by builders and architects during the two-year period ending July 1, 1939, shows great progress. More than 1,100 builders and architects have registered in this competition.

Industrial Gas Section

Hale A. Clark, Chairman Eugene D. Milener, Secretary Frank H. Trembly, Jr., Vice-Chairman

Proven Methods for Selling Gas Unit Heaters to Factories

By W. N. BLINKS

General Gas Light Company, Kalamazoo, Michigan

IN developing this paper on proven methods for selling gas unit heaters to industry it has been necessary not only to draw upon personal experience with selling plans which have been successful, but to request information from some of the gas utility men conspicuous for the results they have secured in this field. Undoubtedly there are many other fine methods. We sincerely hope that some of the ideas advanced may contribute to your future success in closing factory heating contracts.

There are several avenues by which prospects are developed. To name a few: trade publication advertising, direct mail broadsides, listings in directories, such as Sweet's, all contribute toward the creation of interest in gas unit heaters.

Commercial installations in stores and shops frequented by plant officials prove extremely valuable in promoting the unit heater idea. We tend to trust those things with which we are familiar, and are used to. Stores using gas-fired units give that background which is so essential in building confidence in the acceptance of the gas unit heater.

Gas company contacts with industry provide the broadest highway toward the creation of interest in, and the subsequent sale of, unit heaters. Specifically, it is the industrial gas department man who can do most to further the cause.

Architects, plumbing and heating contractors, and builders cannot now be relied upon for very material assistance in promoting unit heaters for industrial heating. Such help will only come with general public acceptance, and that must be created by the gas companies and the equipment manufacturers.

We know that the industrialist is hard boiled, and reluctant to accept systems new to him. He has the opinion that gas for heating is expensive, and only by grouping the costs of the heating system he is using, or planning to use, can his interest in the case for gas and unit heaters be stirred. He also leans heavily on "the other fellow" and what he is doing. Show him what has been done by others, and you have his attention.

Types of Prospects

Under this heading it is my intention to cover different types of prospective unit heater installations.

NEW PLANT PROJECTS. Whether they are entirely new ventures, expansion of going concerns in new localities, construction of new factories due to abandonment of cramped or condemned facilities, or erection of additional plant units, they offer possibilities for all-gas heating. And if your best efforts are not put forth when the plans are being prepared, and before the specifications go out, it may be years before you get another crack at that same factory.

You must sell the owner first on a proposition of this kind. If successful, the work with the architect follows, and finally, the inclusion in the specifications of the gas-fired unit heaters. The contract itself may go through the general builder or the plumbing and heating contractor.

Landing a Big Job

Let me take you through a situation of this kind, a new plant project, where a gas man started something, saw it all the way through and was rewarded with a heating job of better than twenty million B.t.u. hourly input.

In this case, involving a unit of one of the country's largest corporations, the plant engineer of the company in question had authority over building projects. The gas man had frequent contact with this engineer, due to the heavy industrial load already connected. Learning that a new plant was contemplated, to be located about 3,500 feet from the existing structures, he suggested the use of individual, self-contained, gas-fired unit heaters for direct heating, and gas-fired steam boilers for the low temperature process work. While such a system had not even been considered, the gas company man was able to point to enough successful installations on their lines and others to start the ball rolling.

Instructions were issued to the engineering staff to prepare heat loss surveys of the proposed plant, and also to secure complete cost analyses on four types of heating systems: 1, coal-fired steam plant; 2, underground steam line connection with the main plant boilers; 3, gas-fired steam boiler plant; 4, gas-fired unit heaters and gas-fired process steam boilers. Steam unit heaters were figured with each of the first three layouts.

Initial costs, depreciation (10% per year), maintenance, and operating costs were all weighed. At this stage the gas-fired unit heater system installed cost was estimated; other systems costs, we understand, were from actual bids.

The unit heater manufacturer was called in, and in conjunction with gas company men and the prospective customer's plant engineering department, went over the entire proposition, sizing and locating equipment, laying out piping, recommending controls, etc.

Individual thermostatic control was specified, to permit maximum flexibility of operation. Heavy duty, centrifugal fan equipped units were indicated for areas requiring long distance, high velocity air delivery. Quiet operating cabinet units were listed for first aid rooms, power venting facilities were incorporated in the office heating arrangements.

A great deal of importance was attached to other installations. Data were furnished and the customers undoubtedly contacted.

Sample equipment was shipped in for inspection and test.

No Reserve Capacity Needed

When all details were worked out, and not before, a definite bid was submitted by the gas company to plumbing and heating bidders and to the plant engineers. At this time, it was stressed that with gas unit heaters the reserve capacity so necessary with a central steam system would not be required. Should any unit fail, for any reason, this failure would not affect any other unit. With a central plant, stand-by capacity would have been necessary to carry the load during emergencies created by failure of the main boilers.

Unit heaters won the job. In addition, two 100 H.P. process steam gas-fired boilers were purchased, making a 100% gas system.

The annual load for direct heating alone runs into many millions of cubic feet.

Without the continued assistance of the gas company and its knowledge of the building plans through contacts with the customer, there would have been another tall stack belching out smoke.

The selling methods employed produced thousands of dollars of annual revenue.

PLANT ADDITIONS. Many such expansion projects occur, usually without much publicity. In a large proportion of cases, the

Part of paper presented at A. G. A. Conference on Industrial Gas.

Two gas unit heaters suffice for this large factory department. No need to run a big central heating system when only a portion of the factory is operating

plant operator knows that his heating plant is inadequate to carry the extra burden of the new addition. The industrial gas man is, in almost every case, aware of the impending changes before they are made, and therefore has every opportunity to press the cause of gas unit heating equipment. Such expansion may mean added process load as well and erection of boiler facilities may reduce his chances to get it.

One of the finest arguments for gas unit heaters is very pertinent in plant addition projects. Buy only what you need today, you can always add more units when the next extension comes up.

A Casual Follow-Up

An industrial gas man met a customer of his at a dinner dance. He had had an inkling that something was up in the building line, so casually suggested that gas units be employed to heat the new part of the building. It was laughed off, but Mr. Gas Man dropped around at the office with his catalogs and evidence on other industrial and commercial jobs and soon had him interested.

The survey made, a quotation was submitted. The customer said it was way high and that too much equipment was specified. The gas engineer agreed that it was the customer's money which was involved, and suggested that about two-thirds of the unit heaters be installed. If they did the business, fine, if not, it would be up to Mr. Buyer to purchase the balance. To protect himself, the gas engineer got a letter releasing his company of any responsibility as to heating capacity of the installed equipment and signed up the job.

A year later he signed up the same man for unit heaters to handle the older portion of his factory. The skimped job had worked well through the most severe winter in twenty years. In the opinion of the man who sold the job, it worked because the units were mounted low, and could deliver their output right where it was needed, and because the thermostats were locked at 60 degrees, and there never was any pick-up required.

Obviously, neither the industrial gas engineer nor the equipment manufacturer would recommend such practice of skimping, but the results of this undersized installation show that the efficiency of the forced circulation warm air principle of the unit heater is very high. Many large installations are deliberately planned with about ten per cent less capacity than the survey would show necessary. There are a good many things about air movement, air distribution, etc., which are today being studied by a joint committee of the A. G. A. and the unit heater manufacturers. When their findings are made public, a great stride forward will have been made.

To return to the quotation referred to above, we do not believe that the original figure was high, as compared with any other form of heating layout. While figures on this job are not available, it might be interesting to glance at some recent comparisons between unit heater systems and central heating plants on a cost basis.

Case 1

Gas Unit Heater system, installed complete	$3,746.20
Central Steam plant, hand-fired complete	6,375.00
Central Steam plant, oil-fired complete	7,525.00

(No boiler room or stack costs figured)

Case 2

Unit Heater system, including process steam boiler, all controls, installed complete	$ 5,000.00
Stoker-fired steam system	7,860.00
Steam system, including boiler room and stack	10,060.00

One of these cases represents a job in a large city, where labor costs are very high, the other one in a small city. The advantage on the side of the unit heater system is certainly great in either case.

PLANTS WITH WORN-OUT HEATING EQUIPMENT. This field comprises a large percentage of our total prospect list. It is one that presents serious problems as to approach and difficulties not present in new buildings due to installed radiation or other heat distribution layout still considered useful.

As to approach, only the man with an entree into the plant has much chance to learn about the faulty condition of the existing heating system. The industrial gas man is just about the only individual with the gas load at heart who will know when the officials get disgusted with break-downs, slow pick-up, inadequate capacity for sudden cold snaps; to say nothing of uncontrolled temperatures in mild weather, increasing labor cost, disgruntled employees, and fluctuating fuel costs.

Working Conditions Important

There can be no question about the serious nature of dissatisfaction among employees over working conditions. Adequate heat is a working condition of prime importance. The industrial gas man has an ideal solution for the problem of insufficient heat—the gas unit heater. If the central plant still has some useful life, a recommendation that one or more gas units be hung in the cold spots will usually be snapped up eagerly.

Where the central heating boiler is worn out, and particularly where pipe coils or cast-iron radiation has been used as the distribution means, a gas-fired unit heater layout should be recommended. The inefficiency of coils or cast-iron radiation makes the story of forced circulation heating very attractive.

Installation of gas unit heaters can be done at any time, with little interference with production, as the crippled heating plant can be kept going until the new units are ready to light up. If a new boiler and new steam lines and units were installed, it would have to be done in the summer, or production shut down during the installation period.

Here is a typical case. A manufacturing plant with a steam heating system had an annual coal cost of $850, plus ash removal expense, firemen's wages and cost of gas for auxiliary heat in the office. Sixty degrees was about all they could hold in the shop and this was only possible on days of

10 degrees above zero or warmer, with still air.

The gas company learned that this firm was facing such a poor heating condition and also that the old boiler was shot, because the auxiliary gas heating in the office had convinced the officials of the possibilities of gas for heating. They had an idea that it would cost too much, but they wanted to find out.

Right there is one of the finest methods of selling factory heating. Get one or more units installed to handle off-hour requirements, week-end booster heating, spring and fall heating when the main steam plant is not fired, severe weather pick-up. The nearer this piece of equipment is installed to the working headquarters of the officials, the better the selling job it can do. It gives you a head start when the bigger job comes up.

To return to our plant with the broken down boiler, permission was secured to survey the buildings. Estimates of equipment and annual gas cost were prepared. Bids on new steam boilers were secured. Attached to existing radiation, and not considering necessary repairs and re-location of piping, the boiler bids ran between $1,900 and $2,000. Cost of the gas unit heater system was $2,000.

Actual figures are better than estimates, so we are glad to be able to quote them. The job went gas. During the normal winter of 1936-7, the gas cost was $1,100. Temperatures were kept at 65 degrees during the working hours, and 50 degrees at all other times. There was less time loss on the morning start, due to quick pick-up, less time off for illness and generally a better working condition than previously.

During the last summer an addition was built, which presented no heating problems, thanks to the unit heater system. New gas units were purchased for the added space. Had the old boiler been replaced with a new one in 1936, that one year old boiler would have been inadequate.

PREVIOUSLY UNHEATED BUILDINGS, OR THOSE LACKING GENUINE HEATING PLANTS. A large percentage of the industrial firms with which you deal have on their premises structures which either never have been equipped with heating systems, or have had such systems stripped out. For one reason or another, the management of any one of these companies may decide either to utilize this unheated space for active production or to provide heat to improve working conditions. Heating immediately becomes an important consideration.

Main heating plant facilities are found to be loaded up, and what is to be done? The industrial gas man, in his ordinary routine, is almost sure to learn about such plans. The set up is one of the "naturals" for gas unit heaters. It should be followed up vigorously, particularly where ample gas services already exist due to industrial demand. This eliminates the heavy charges for new services.

Additions to any plant need no longer be held up because the central heating plant is inadequate. Gas unit heaters will do the trick

PARTIALLY OPERATED PLANTS. This has long been considered a most fertile field for gas unit heater sales to industry. During periods of slack operation, or in cases where some departments are shut down, or where small industries have leased portions of large, vacant plants, the existing central heating plant would be vastly oversized, and usually inefficient for the job at hand.

A situation of this kind arose recently in a city where natural gas was just being turned in. A fine modern plant stood idle, all attempts to sell or lease having proved futile, it was decided to lease portions to create a little central manufacturing district.

The local industrial gas engineer learned that a firm considering taking space in this "district" would require gas for processing. Adequate service was already in the plant. He brought up the subject of heating, listed the advantages of gas unit heaters, made the proposal, and had it accepted. During the negotiations, so much interest was aroused that it appears certain that unit heaters will be installed in other portions of the plant as occupied.

Summary

The job of selling gas unit heaters to factories represents a constant challenge to, and a proving ground for, the sales ability of the gas companies and of the equipment manufacturers. There are no short cut methods for selling unit heaters for industrial heating, no politician's panaceas. You must prove that you have a better service to offer for the owner's dollar.

Industrial & Commercial Advertising for October

The Advertising Committee of the Industrial Gas Section, J. P. Leinroth, chairman, and F. B. Jones, vice-chairman, announce that full-page advertisements will appear in the following trade and business magazines during the month of October:

Magazine	*Date*	*Topic*
American Restaurant	October 1	Gas for Commercial Cooking
Bakers Helper	October 15	Improved Bake Ovens
Bakers Weekly	October 8	Improved Bake Ovens
Ceramic Industry	October 1	Gas in the Ceramic Industry
Food Industries	October 1	Gas for Heat Processing of Foods
Hotel Management	October 5	Gas for Commercial Cooking
Industrial Heating	October 10	Gas for Heat Treating Metals
Iron Age	October 15	Gas for Heat Treating Metals
Metals and Alloys	October 10	Gas for Heat Treating Metals
Metal Progress	October 1	Gas for Heat Treating Metals
Modern Hospital	October 1	Gas for Commercial Cooking
Steel	October 3	Gas for Heat Treating Metals

Industrial Gas Sendout Gains 80 Per Cent

TREMENDOUS strides have been made by the Citizens Gas and Coke Utility, Indianapolis, Ind., in the sale of gas to industrial users. Since 1929, this utility reports, sendout to industrial gas customers has increased 80 per cent. Gas consumption of industrial users accounts for 25 per cent of the company's total gas sales.

How such progress has been made in a period of business depression is explained as follows by N. R. Gorsuch of the Indianapolis utility:

"The answer is not in reduced rates for industrial business is seldom secured on the basis of competitive cost of fuel. Nor is it in high-pressure selling. You can't sell a hard-boiled plant manager with the technique of a vacuum cleaner salesman. Actually, it is due to a combination of several factors—the inherent advantages of the fuel, constant improvement in burners, furnaces and other equipment through laboratory research and practical experience, and careful study of the customer's individual heating requirements."

Resigns Industrial Gas Publicity Post

J. B. Nealey

ON August 31 a luncheon was given by members of A. G. A. headquarters' staff at the Engineers' Club, New York, for J. B. Nealey, who has been director of industrial publicity for the American Gas Association for the past dozen years. The luncheon was presented to Mr. Nealey following announcement of his resignation from the Association, effective September 1.

Mr. Nealey came to the American Gas Association in 1926 with a varied engineering and editorial background. He was educated at Ohio Wesleyan University, Columbia University and Massachusetts Institute of Technology, graduating from the latter in 1911 with a Civil Engineering degree. He engaged in a number of engineering activities until the World War, in which he participated as commander of a battery of field artillery. Following the war, he was associate editor of the *New York Commercial*, a daily business paper, now extinct, and wrote for various business and trade magazines. Immediately prior to coming to the Association he was engaged in publicity work in the industrial gas equipment field.

His work with the Association consisted largely in the preparation of feature articles and other material on the use of gas in industry and in commercial establishments. This material has appeared in many of the leading engineering and trade journals during this period, and its high standard has obtained wide editorial acceptance.

Short talks were made at the luncheon by Alexander Forward and Charles W. Person, managing director and publicity director, respectively, of the Association. Others who attended, in addition to Mr. Nealey, were: Eugene D. Milener, H. W. Hartman, K. R. Boyes, A. Gordon King, C. G. Segeler, Paul Ryan, Luis Hilt, H. A. Sutton, Public Service Electric & Gas Co., Harold O. Andrew and Harold W. Springborn, both of Robbins Publishing Co., and J. M. Beall.

A Stimulating Gas Display

Industrial gas window display in Detroit

THE main office building of the Detroit City Gas Co. is never without an industrial gas window display. For several years the products of various well-known local manufacturers have been shown, together with interesting information showing how gas plays an important part in their manufacture.

During the hot weather of the latter part of this summer a different kind of industrial gas exhibit occupied one of the prominent show windows. Being seasonally appropriate, a gas engine-driven refrigeration machine was exhibited and kept in operation each day from 8 A.M. until midnight. Instead of supplying a conventional refrigeration coil, this gas-driven system supplied a special coil that spelled out the words "Gas for Power."

The sight of this unusual sign, ice cold, made an impression on thousands of people passing by on the torrid sidewalks.

There were several cleverly worded cards to give information to those who stopped in front of the window. Chief emphasis was on the merits of driving refrigeration and summer air conditioning equipment with gas engines. But other uses of power were not overlooked and were emphasized too. Detroit being an automobile city, attention was called to the adaptability of automobile engines to gas for driving all kinds of machinery.

Continental Motors Corporation and Detroit Ice Machine Co. cooperated with the Industrial Division of Detroit City Gas Co. in producing this display. The former supplied the gas engine and the latter supplied the refrigeration machine, which was of Frick Co. manufacture. The display not only started people talking about gas engine power but produced several definite sales inquiries.

The industrial gas window displays of the Detroit City Gas Company are prepared under the supervision of Hale A. Clark, chairman of the Industrial Gas Section of the American Gas Association, who is industrial engineer of the Detroit company. In these displays he is assisted by C. Foster Clark of the Industrial Department.

Technical Section

J. V. Postles, Chairman H. W. Hartman, Secretary F. M. Goodwin, Vice-Chairman

The Manufacture of High B.t.u. Carburetted Water Gas

By H. VITTINGHOFF

Consulting Engineer, Stone & Webster Engineering Corp., New York, N. Y.

DURING 1937 the Public Service Company of Northern Illinois decided to build an addition to a plant to produce high B.t.u. carburetted water gas and commissioned Stone & Webster Engineering Corporation to design and construct such a plant. The company normally purchases all of its mixed gas requirements through The Peoples Gas Light & Coke Company of Chicago and this gas is a mixture of natural gas, reformed natural gas, coke oven gas and carburetted water gas. The proportion of components varies materially from season to season, but they are always so adjusted as to produce a mixed gas with reasonably constant burning characteristics as well as a uniform heating value of 800 B.t.u. approximately.

In building this plant Public Service had three specific purposes in view: First, to maintain itself in position to produce a certain number of therms of gas per day. Second, to produce gas which when mixed with the gas obtained from Peoples Gas would augment the natural gas purchased by the combination of the two companies in such a way as to control the load factor of natural gas purchases. Third, to make a gas which could be substituted for the mixed gas normally furnished by Peoples Gas in the event of a natural gas service interruption.

Operating Background

Under the conditions governing operation of Public Service Company, their production plants are currently called upon to operate only for relatively short periods annually, and obviously it was necessary to develop a plant low in capital cost so as to reduce to a minimum fixed costs on the gas produced. At the same time the plant had to be such that in emergency it could be started up quickly and brought to proper functioning within a very short period of preliminary operation.

The generating equipment finally selected was a 12-ft. Semet-Solvay Engineering Corporation Reverse Flow Set equipped with a 9-cam U.G.I. automatic control and a turbine driven blower capable of delivering 32,000 cu.ft. per minute under a pressure of 50 inches, all housed in a new steel-frame building. The set was equipped with hot valves since it was felt that in the production of high B.t.u. gas the capacity of the carburettor and superheater would be heavily taxed due to the large quantity of oil which had to be handled per cycle and, therefore, the back run system of operation appeared to present no merits. Auxiliary equipment was also provided, but does not require any further description since it was of standard design and did not differ in any respect from the usual apparatus found in water gas plants.

The details of construction of the set are well known through the descriptions disseminated by Semet-Solvay Engineering Corporation and the following discussion concerns itself mainly with the results obtained during the acceptance test.

Experimentation

It was recognized that, especially with respect to the phase of the problem referring to the production of a substitute gas similar in characteristics to that furnished by Peoples Gas Company, the operation of the set was largely a matter of experimentation and that in starting up the operators would have to feel their way in order to develop the most suitable procedure. For this reason, but particularly because of the stringent requirements as to interchangeability of gas placed upon the production department by the distribution department of the Company, the test work as actually carried out was restricted to relatively short periods on the days when the set was operated. Actually during the test period extending over approximately five weeks, the set was operated at about 1/10 of normal daily rating. The long shutdowns and short daily operating periods naturally had an adverse effect on the results obtained and it is reasonable to assume that normally much better efficiencies could be obtained both in respect to solid fuel and oil consumption.

The materials used were a high grade of by-product coke with very low ash content and a 32° to 34° A.P.I. gravity gas oil of excellent enriching characteristics.

During the days when it was attempted to make a gas suitable to augment the supply of mixed gas furnished by Peoples Gas Company, the results shown in the table below were obtained.

It will be noted that there is a considerable variation from day to day in the specific gravity, heating value and hydrogen content of the gas manufactured, but since each of these days represents only a relatively few hours of operation it can be safely assumed that under normal conditions such variation would be smoothed out as the gas passed through the relief and storage holders before it is delivered into the distribution system. Furthermore, under continuous operation the large variations shown by the above figures would not have occurred.

Appliance Tests

While the production department was making this gas the distribution department of the company conducted a series of tests on a large number of appliances under widely varying burner adjustments representing the extremes of adjustments which might be found in the field and it was shown that the gas as made was entirely suitable to be mixed in equal proportions with gas furnished by Peoples Gas Company and to be sent out into the dis-

	Date	*Sp.Gr.*	*B.t.u.*	*H_2%*	*MCF Make/Run*	*Gal. Oil Per MCF*
Jan.	10	.60	780	29.8	18.2	8.45
	11	.64	826	32.6	20.0	8.60
	12	.62	794	31.8	21.6	8.25
	14	.62	825	33.3	18.7	9.10
	19	.64	830	27.9	17.9	8.40
	20	.62	844	33.4	18.4	8.41
	28	.63	832	30.5	16.7	8.20
	31	.64	829	25.9	15.6	8.27
Average		.626	820	30.6	18.4	8.46

Paper presented at joint conference of the Production and Chemical Committees, A. G. A.

tribution system without in any way inconveniencing any customers through the malfunctioning of appliances. It is true that the burning characteristics of the gas manufactured in the set were somewhat different from those inherent in the gas furnished by Peoples Gas Company as could be noted in the laboratory when changing from one gas to the other. It is to be questioned that any but a very few customers would actually observe any change in behavior in their own appliances. A typical analysis of the gas made is represented by the results obtained on January 28 and is shown below:

CO_2— 1.1%
Olef.—15.8%
O_2— 0.6%

CO—13.7%
H_2—30.5%
CH_4—33.1%
C_2H_6— 1.4%
N_2— 3.8%

Blue Gas	34.7%—	297 B.t.u.
Oil Gas	65.3%—	1140 B.t.u.
Cu.ft. Oil Gas per Gal.		79.8
B.t.u. per Gal.		91200

A typical analysis of gas furnished by Peoples Gas Company to Public Service Company of Northern Illinois is stated to be as follows:

CO_2	1.0%
Olef.	2.1%
O_2	0.2%
CO	2.8%
H_2	24.8%
CH_4	55.6%
C_2H_6	6.8%
N_2	6.7%

A 50-50 mixture of this gas with the gas manufactured during the test under consideration would have a composition as follows:

CO_2	1.0%
Olef.	9.0%
O_2	0.4%
CO	8.3%
H_2	27.6%
CH_4	44.4%
C_2H_6	4.1%
N_2	5.2%

It is interesting to note that this mixture which, by the consensus of opinion of all concerned was a satisfactory substitute for the gas normally sent out by Public Service Company of Northern Illinois, varied largely in chemical composition from the latter gas. However, it is not claimed that the gas made in the set during these particular test runs would be satisfactory under normal conditions as a 100% substitute for the gas normally delivered by Peoples Gas Company.

It was not possible to determine accurately the weight of fuel used for production as distinguished from the total fuel used for both production and bringing the set up to heat after long stand-bys, but from such observations as could be made it appears that the fuel consumption was not in excess of 21 lbs. of coke per MCF while the oil consumption to make 820 B.t.u. gas averaged only 8.46 gal. per MCF or approximately 8.25 gal. for 800 B.t.u. gas. Under normal conditions the set should perform at the rate of 10.5 cycles per hour so that during a 22-hour operating day the rating of the set as established by the intermittent test works out to 4,250 M cu.ft. of 820 B.t.u. gas equivalent to 35,000 therms per day.

One of the conditions which the manufacturer of the set undertook to meet was the continuous operation of the set without an undue amount of difficulty from lampblack or heavy tar formation. On the basis of the observations made during the test period it can be definitely stated that when making a gas with a gravity of .62 or .63 the operators will not encounter any difficulty in the handling of tar nor will carbon deposits tend to be built up in the machine.

indicate the hydrogen content of a gas made during a continuous run:

Sample 1	Time 11 A.M.	25.3%
Sample 2	Time 2 P.M.	36.2%
Sample 3	Time 7 P.M.	23.6%
Sample 4	Time 12 Midnight	36.2%
Sample 5	Time 5 A.M.	22.9%
Sample 6	Time 10 A.M.	27.6%
Sample 7	Time 2 P.M.	32.8%
	Average	30.0%

The difference between the average and samples No. 2 and 4, which show a relatively high percentage of hydrogen, is that the latter were analyses made in a Bureau of Mines apparatus, while all the other samples were analyzed on another well-known type of equipment and showed much lower hydrogen content. All analyses referred to in this discussion were made on the Bureau of Mines apparatus, while an Edwards Balance was used to determine specific gravity.

During the trials when it was attempted to make a low gravity high B.t.u. gas, the following results were obtained:

	Date	*Sp.Gr.*	*B.t.u.*	*H_2%*	*MCF Make/Run*	*Gal. Oil Per MCF*
Jan.	10	0.57	787	36.5	20.5	8.10
	20	0.58	794	37.8	18.3	8.60
	25	0.59	812	35.1	17.1	8.52
	26	0.57	795	39.8	18.9	8.78
	27	0.57	781	36.9	17.1	8.97
Average		0.576	794	37.2	18.4	8.59

The above tests indicated that the machine could readily make the required quantity of gas of a quality suitable for admixture with gas furnished by Peoples Gas Company, but it remained to be shown that the machine could make a substitute gas which could be burned in the appliances of the customers of Public Service Company of Northern Illinois without having to resort to a general campaign of appliance adjustments or, indeed, without inconveniencing the customers because of the change in gas characteristics especially in connection with appliances now adjusted on the hard side, i.e., appliances with air shutters adjusted so as to give a relatively large proportion of primary air and a relatively small proportion of fuel. The operators of Public Service Company thought that an ideal situation would be for such a gas to have a specific gravity of about 0.54 and a hydrogen content not in excess of 32%. This objective was not quite reached as any attempt to reduce the gravity to the point indicated was always accompanied by an increase in hydrogen content which was not desirable because of its effect on burner performance.

In this connection it is to be recommended that any comparison of gas analyses always be made with reference to a certain standard of analytical equipment. In connection with a similar problem, test-results were submitted which purported to

A typical analysis of this type of gas is represented by the following:

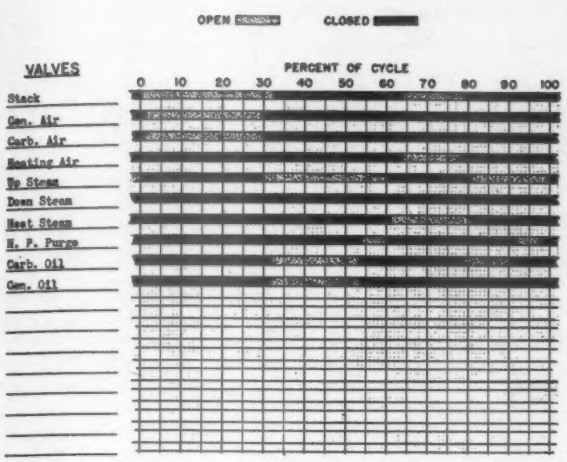
CO_2— 0.7%
Olef.—10.5%
O_2— 0.5%
CO—11.9%
H_2—36.5%
CH_4, C_2H_6 —34.1%
N_2— 5.8%

Blue Gas	31.0—	277 B.t.u.
Oil Gas	69.0—	953 B.t.u.
Cu.ft. Oil Gas Per Gal.		—85.2
B.t.u. Per Gal.		—81000

The capacity of the set was practically the same as that observed when making gas of somewhat higher gravity while the oil consumption rose only to 8.59 gal. per M for making 794 B.t.u. gas which is equivalent to approximately 8.7 gal. per M for 800 B.t.u. gas. The hydrogen content of this gas was somewhat higher than desired and the burning characteristics were markedly different from those of Peoples Gas mixture. However, the only case of a malfunctioning of any of the appliances which was observed occurred in the case of a single burner which had been deliberately adjusted to produce an extremely hard flame with the Peoples Gas mixture and which flashed back when the pressure on the burner was deliberately lowered from 5" to 3"—an extreme test. If in an emer-

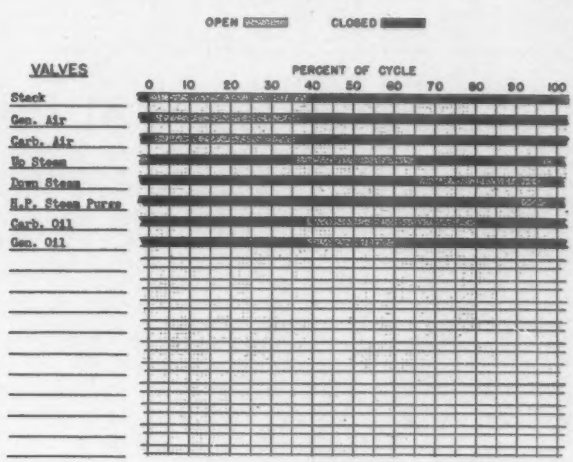
CYCLE DIAGRAMS—NILES CENTER PLANT

Heat Up Cycle



Remarks:			
Sp.gr.	0.57-0.58	0.61-0.62	0.65
Temperature T_2 (Middle of superheater)	1725°	1630°	1580°
Make steam, lbs./min.	60	60	60
Heat steam, lbs./min.	140	140	140
Generator air, cu.ft. per min.	12500	11500	10800
Carb. air, cu.ft. per min.	11000	10500	10000
Heat air	14200	14000	13700
Total oil	154	148	135
Oil on fire	10-15%	10-15%	10-15%

Up and Down Cycle



Remarks:			
Sp.gr.	0.57-0.58	0.61-0.62	0.65
Temperature T_2 (Middle of superheater)	1725°	1630°	1580°
Up make steam, lbs./min.	60	60	60
Down make steam, lbs./min.	60	60	60
Generator air, cu.ft. per min.	12000	11000	10200
Carb. air, cu.ft. per min.	12000	11000	10200
Total oil—gals	154	148	135
Oil on fire	10-15%	10-15%	10-15%

gency it had become necessary to distribute this gas in substitution for Peoples Gas, it is believed that the situation could have been adequately met without putting a serious strain, in the form of complaint calls, on the distribution department. The tests made in the laboratory on the appliances were not, and could not be, sufficiently all-inclusive to permit positive proof of such a statement. The belief expressed is based on the consideration that since a mixture of equal parts of gas furnished by Peoples Gas Company and 0.63 specific gravity gas manufactured in the set resulting in an average specific gravity of 0.59 was actually sent out into the district without causing any increase above the normal number of daily complaint calls whatever; therefore, if in an emergency, gas be sent out having a gravity of 0.576 such gas should not result in an undue increase in complaint calls, even though the somewhat higher percentage of hydrogen would result in a change in burning characteristics.

While making gas of this lower gravity, it was observed that greater quantities of carbon were deposited in the set than when 0.63 gravity was made and some trouble was experienced due to heavy tar. The carbon deposits which were observed were not so heavy but that regular scurfing of the set for one or two hours a day should prevent the blocking of any part of it with carbon and the trouble experienced with heavy tar was not so serious but that with close attention given to this phase of operation any interference with production need be feared.

As a matter of fact only the heavy tar which settled in the cone bottom of the wash box and which was not carried out of the wash box regularly with each cycle was the cause of the minor trouble experienced, and it was found that when this heavy tar was mixed with the light tar simultaneously formed and carried away regularly, the mixture became sufficiently fluid to permit normal handling by the available pumping equipment. A slight modification in the method of handling the tar from that pursued during the test period should avoid any serious difficulty from this source.

The manufacturers of the set proposed two alternative methods of operation, one, the standard "up and down cycle" and the other a so-called "heat up cycle" which consisted of a standard blast followed by an up-steam run and followed in turn by a reheat period during which steam was passed downward through the generator and the resulting blue gas burned in the carburettor and superheater, this reheat period being followed by a second up-steam run. The two cycles are illustrated by diagrams on which are also indicated numerical values relating to temperatures and quantities of air steam and oil which appear suitable for making the type of gas under consideration.

The observations made did not seem to indicate that the heat-up cycle had any particular merits as far as the production of 800 B.t.u. gas was concerned, although, since this heat-up cycle would tend to dampen out temperature fluctuations it may be distinctly valuable when making a 1,000 B.t.u. gas involving the use of still greater quantities of oil per cycle. There are, of course, other methods of operation available to the experimenter and the one which occurs immediately is the introduction of steam into the carburettor together with the oil, with the possibility of performing a measurable degree of methane synthesis. As far as could be told, whatever methane was produced during the test period originated from pyrolysis only. The addition of steam into the carburettor is indicated when it is considered, that whereas normally a large amount of undecomposed steam passes through the generator, in this case, when making only small proportions of blue gas and using small quantities of steam per cycle, very high generator temperatures are encountered with the result that steam decomposition is carried far beyond the normal ratio. No definite statements in regard to this method of operation can be made since it was not tried

(Continued on page 367)

Testing Laboratories

R. M. Conner, Director — Chairman, Managing Committee, N. T. Sellman

Technical Phases of Propane-Butane Utilization

W. R. Teller

By W. R. TELLER

Research Engineer,
A. G. A. Testing Laboratories

IN the previous issue of this magazine the writer in an article entitled "Research Adds New Laboratory Test Gas" discussed certain findings made during investigation of the performance of appliances on liquefied petroleum gases recently conducted for several of the Association's approval requirements committees. In addition to the data presented in that paper, other results were obtained which it is hoped will be of assistance to those interested in the utilization of propane and butane gases.

Two general subjects are treated herein; first, the flow of these gases through orifices, and secondly, the relationships between CO_2, flue gas temperature, and the corresponding flue losses. While data of this nature appear in several publications, notably the Gas Engineers' Handbook, the American Gas Association's volume on Combustion, and Handbook on Butane-Propane Gases, frequent inquiries have nevertheless been received at the Testing Laboratories for information on these subjects. Moreover, certain of the data are believed to be new and are probably not available elsewhere. An endeavor has been made to present the results in a manner which, on the basis of numerous interviews with manufacturers and others on these problems, seems most adaptable to ordinary usage.

In general the flow of both propane and butane through orifices was found to be in agreement with the familiar equation which follows:

$$Q = 1658.5\ AK\sqrt{\frac{h}{d}}$$

Where:

Q = flow through orifice, cu.ft. per hr.
A = area of orifice, sq.in.,
K = coefficient of discharge,
h = gas pressure at orifice, in. of water, and
d = specific gravity of gas (air = 1.0)

Inasmuch as it is generally desired to solve this equation for the area of the orifice (A), and since B.t.u. input rates are more commonly employed than cu.ft. rates in appliance testing work, a more convenient form of the foregoing equation is:

$$A = \frac{I\sqrt{d}}{1658.5\ KV\sqrt{h}} \qquad (1)$$

Where:

I = input rate, B.t.u. per hr., and
V = heating value of gas, B.t.u. per cu.ft.

In employing equation "1" the input rate in B.t.u. per hour (I) will be established, of course, by the appliance or burner rating. The specific gravity of the gas (d), if not specified by the distributor, may be assumed as being 1.53 and 2.0 for propane and butane respectively. The coefficient of discharge (K) will vary for different sizes and types of orifices. While this aspect of gas flow through orifices will be discussed in greater detail in following paragraphs, a value of 0.82 for the coefficient (K) can be employed for types of orifices having angles of approach ranging from 12 to 60° inclusive, and for orifice sizes ranging from No. 45 to No. 80 D.M.S. without introducing serious error. The heating value of the gas (V), if not specified by the distributor, may be considered as 2,500 and 3,175 B.t.u. per cu.ft. for propane and butane respectively. The gas pressure (h) may be selected as 11 in., since this is the adjustment pressure specified in the approval requirements covering appliances for use on liquefied petroleum gases as well as a typical distribution pressure for such gases.

On the basis of the foregoing typical values for the several variables in equation (1) the following further simplified forms should be found quite convenient to use:

For propane—$A = 0.000000111\ I$ (2)
For butane —$A = 0.0000010\ I$ (3)

It will be seen that it is only necessary to multiply the desired B.t.u. input rate (I) by 0.000000111 in the case of propane and by 0.0000010 for butane in order to obtain the required orifice size in square inches. These two equations are not only convenient but should, with the exception noted in the following, be sufficiently accurate for most purposes.

The average coefficient of discharge (K) for various sized orifices having angles of approaches ranging from 12 to 60° are shown in Figure 1. The four orifices having these angles of approaches are sketched in Figure 2 together with a fifth type of orifice having a 90° angle of approach. In general it was found that the coefficient of discharge for any given size of orifice was the same provided the angle of approach was between 12 and 60° inclusive. However, the coefficient of discharge for the type of orifice having the 90° angle of approach was considerably lower than the coefficients of the other types of orifices studied. This is illustrated by typical data given in Table 1 for three orifice sizes and each of the five orifice types. It is readily apparent that the coefficients for the first four types are quite similar whereas that for the orifice having a 90° angle is appreciably lower. Thus, for this latter type of orifice equations "2" or "3" should not be used but rather equation "1" with a value for "K" of approximately 0.64.

It was observed during the course of the investigation of the performance characteristics of appliances on liquefied petroleum gases that quite appreciable variations existed between the flow rates of different orifice spuds of the same type and presumably having the same drill size. It was evident that unless care was exercised the actual diameter of the orifice opening

TABLE 1

EFFECT OF TYPE OF ORIFICE ON COEFFICIENT OF DISCHARGE "K"

Type See Fig. 2	*Angle of Approach*	*No. 72 D.M.S. Orifice*	*No. 57 D.M.S. Orifice*	*No. 55 D.M.S. Orifice*
IV	12	0.82	0.83	0.83
V	15	0.82	0.82	0.83
II	19	0.82	0.80	0.82
I	60	0.80	0.81	0.80
III	90	0.64	0.63	0.65

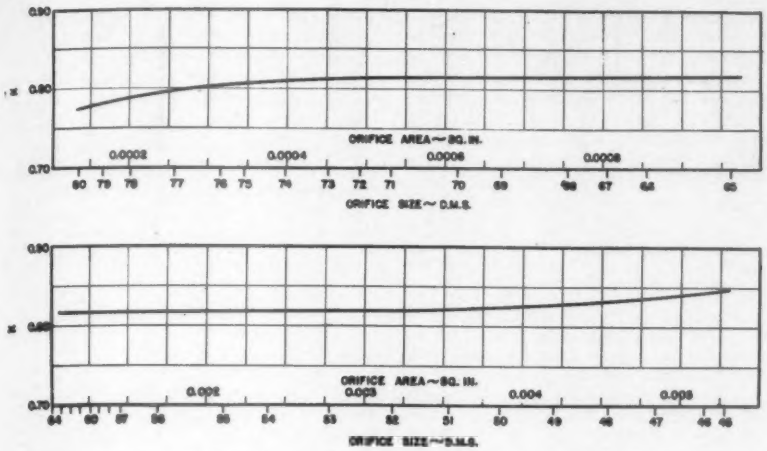


Fig. 1. Coefficient of discharge (K) for liquefied petroleum gases

would depart sufficiently from the nominal drill size to affect measurably the orifice capacity with those gases having such a high heating value. As a consequence it was necessary in order to obtain consistent and reproducible data during the investigation to hand-ream the orifices carefully. It is particularly important, therefore, to observe utmost precaution in commercial drilling of orifices for liquefied petroleum gases.

Drill Size

It was also noted that considerable difficulty existed in obtaining approximately the correct input rates with numbered drill sizes due to the rather large differences in areas between certain consecutive drill numbers. It would seem advisable, therefore, to give consideration to use of fractional and millimeter drill size, both of which are standard. For example, there are three millimeter drill sizes (1.2, 1.25, and 1.3) and one fractional drill size (3/64 in.) between a No. 55 and a No. 56 D.M.S. drill.

In using the foregoing equations for computing orifice sizes it is to be noted that the gas pressure (h) is, strictly speaking, the static pressure head of the gas directly back of the orifice. The experimental work was conducted on this basis, that is, flow rates were in every case identified with static gas pressures measured near the orifice. With any appliance the gas pressure at the orifice is generally not accurately known due to the pressure drop through the various controls and piping.

With city gases the pressure drops at the manufacturer's input rating are quite appreciable on certain types of appliances, often approaching one inch equivalent water column. Thus, with such gases the pressure drop should be estimated and subtracted from the inlet or line gas pressure, the resultant pressure to be employed for orifice size calculations.

In the case of liquefied petroleum gases the pressure drop through piping and controls on a majority of appliances is usually so small that it can safely be neglected. This is particularly true for appliances which have been approved for use on natural and manufactured gases and on which the same size piping and controls are retained for propane or butane. In such cases the inlet or line pressure can be used in orifice size computations without regard to pressure drop.

As previously indicated the simplified equations "2" and "3" were based on an inlet gas pressure of 11 in. since this pressure is that at which the normal gas rate adjustments are made for approval testing purposes and is, moreover, a common distribution pressure for such gases. However, if some other pressure is employed, equation "1" should, of course, be used and the appropriate value substituted for the pressure (h).

For readers who do not wish to resort to the formulae for calculating orifice sizes, data have been assembled in Table 2 showing the capacities for various orifices ranging in size from 0.004 in. diameter to No. 45 D.M.S. These capacities, as will be noted, are for commercial propane and butane gases when supplied at a pressure of 11 in. of water. They were determined for the orifice type having a 19° angle of approach (Type II, Figure 2), but are, however, also applicable to orifice spuds having angles of approach of 12 to 60° inclusive (Types I, IV and V, Figure 2). If an orifice spud having a 90° angle of approach (Type III, Figure 2) is used, the area of the orifice selected from Table 2 should be increased by about 25%.

The difference between the 90° orifice and the other types studied is also significant from the standpoint of primary air injection. Generally speaking, a high coefficient of discharge is desirable since the higher this coefficient the greater is the portion of static gas pressure head converted into velocity head in the jet issuing from the orifice. And since the primary air injection for any burner with a given gas supplied at a constant B.t.u. rate is approximately proportional to the jet velocity, it follows that the entrainment of primary air will be increased as the coefficient of discharge is increased. Adequate primary air injection is frequently a serious problem with propane and butane and the advisability is therefore indicated of using orifice spuds having angles of approach of from 12 to 60°, in preference to those having a 90° angle of approach, since as may be noted from Table 1 the coefficient of discharge for this latter type of orifice was only about 0.64 as compared with 0.81 for the other types.

Another phase of the utilization of propane and butane that is quite important in gas appliance design and testing work is the composition and temperature of the

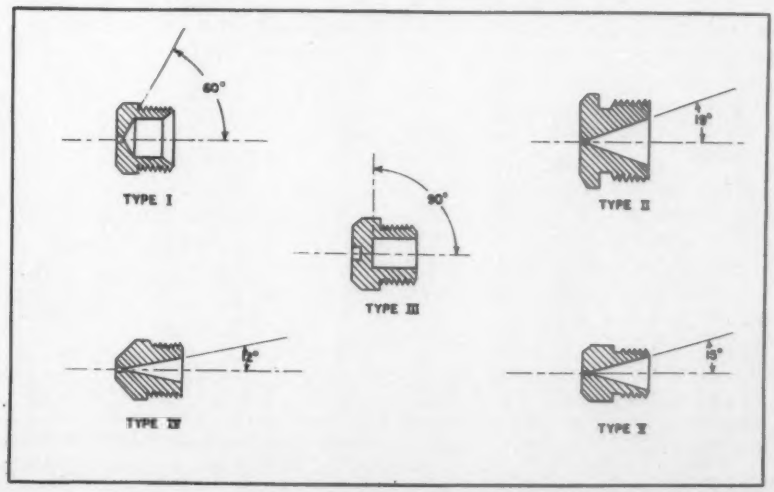


Fig. 2. Various types of orifice spuds used in the investigation

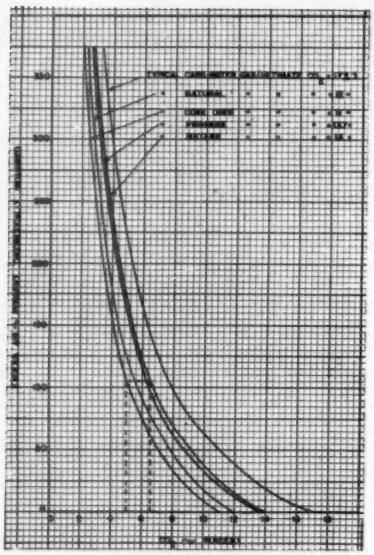


Fig. 3. Relationship between CO_2 and per cent excess air

flue gases and the relationship between these variables and the combustion and efficiency characteristics of an appliance. The aeration of an appliance or the concentration of excess air in the flue gases is ordinarily evaluated in terms of their CO_2 or O_2 content as determined by analysis. Consequently the relationship between the more fundamental characteristic, excess air, and the CO_2 or O_2 content of the flue gases must be thoroughly considered before these last mentioned variables can be used to best advantage. Excess air in the sense commonly used is the volume of excess air expressed as a percentage of the volume of air theoretically required for complete combustion, both volumes being identified with a unit of gas consumption. The percentage of excess air can be calculated from the CO_2 or O_2 content of the flue gases on the basis of the following equations:

$$E = \frac{(U - CO_2)}{CO_2} \times \frac{100\ P}{A}$$ (where CO_2 only is determined)

$$E = \frac{O_2}{(20.93 - O_2)} \times \frac{100\ P}{A}$$ (where O_2 is determined and used)

Where for both equations:

E = excess air, per cent of air theoretically required for complete combustion
U = ultimate CO_2, per cent
CO_2 = CO_2 in flue gases (determined by analysis) per cent
P = theoretical dry products, cu.ft. per cu.ft. of gas burned
A = air theoretically required for complete combustion, cu.ft. per cu.ft. of gas, and
O_2 = oxygen in flue gases (determined by analysis) per cent.

For approximate work the quantity $\frac{100\ P}{A}$ in these equations can be set equal to 90. The relationships between CO_2, O_2 and excess air for several typical city gases as well as propane and butane are shown in Figures 3 and 4, only a single curve being shown in the latter since the relationships between O_2 and excess air for the gases considered are practically identical.

Usefulness of Data

In considering the usefulness of the foregoing data it should be carefully noted that an appliance operating at a given input rating on any gas and possessing good flame characteristics under all conditions will almost invariably yield for each gas about the same performance from a combustion and efficiency standpoint provided the appliance is supplied with the same amount of excess air. While exceptions to this generality may be found, these cases can usually be detected by the appearance of the burner flames. For example, in changing from a manufactured or natural gas to propane or butane the burner may not be able to inject adequate primary air and thus yield long, soft and possibly yellow-tipped flames or the flames may lift from the port due to insufficient port area. In such cases the combustion may be unsatisfactory with butane or propane although the same amount of excess air may be present with these gases and the manufactured or natural gas. As previously indicated,

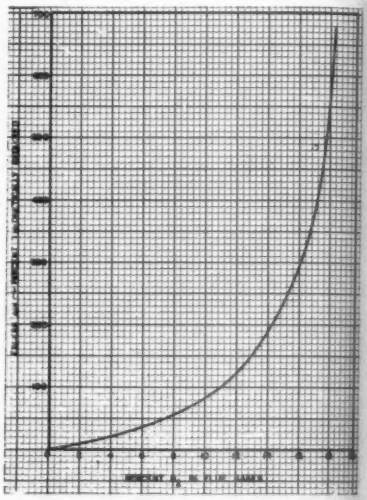


Fig. 4. Relationship between O_2 and per cent excess air

TABLE 2

RATE OF FLOW OF PROPANE AND BUTANE THROUGH ORIFICES
(19° Angle of Approach and 11 In. of Water Pressure at the Orifice)

Orifice Size D.M.S.	Flow Rate: Propane Cu.Ft. Per Hr.	Propane B.t.u./Hr.	Butane Cu.Ft. Per Hr.	Butane B.t.u./Hr.	Orifice Size D.M.S.	Flow Rate: Propane Cu.Ft. Per Hr.	Propane B.t.u./Hr.	Butane Cu.Ft. Per Hr.	Butane B.t.u./Hr.	Orifice Size In. Dia.	Flow Rate: Propane Cu.Ft. Per Hr.	Propane B.t.u./Hr.	Eutane Cu.Ft. Per Hr.	Eutane B.t.u./Hr.
45	19.60	49,000	18.0	57,200	63	3.935	9,850	3.41	10,830	0.004	.0555	138	.0588	187
46	18.46	46,150	17.35	55,100	64	3.72	9,300	3.26	10,350	0.008	.1899	475	.188	599
47	17.60	44,000	16.15	51,300	65	3.52	8,800	3.06	9,725	0.009	.2482	621	.228	724
48	17.1	42,750	15.18	48,200	66	3.135	7,840	2.74	8,700	0.010	.3185	797	.302	960
49	15.29	38,230	13.32	42,300	67	2.965	7,420	2.585	8,215	0.011	.368	930	.326	1036
50	14.12	35,300	12.48	39,650	68	2.79	6,980	2.39	7,590	0.012	.410	1025	.370	1173
51	12.89	32,220	11.43	36,300	69	2.435	6,090	2.125	6,750					
52	11.93	29,820	10.01	31,800	70	2.245	5,615	1.968	6,250					
53	10.00	25,000	8.87	28,150	71	1.938	4,845	1.685	5,350					
54	8.85	22,130	7.61	24,170	72	1.797	4,490	1.559	4,950					
55	7.78	19,450	6.76	21,470	73	1.635	4,090	1.422	4,520					
56	6.27	15,680	5.43	17,240	74	1.422	3,555	1.23	3,910					
57	5.295	13,240	4.635	14,710	75	1.255	3,140	1.09	3,460					
58	5.08	12,700	4.45	14,110	76	1.113	2,825	.986	3,130					
59	4.845	12,120	4.19	13,310	77	.891	2,230	.782	2,485					
60	4.57	11,420	4.02	12,760	78	.708	1,770	.622	1,975					
61	4.37	10,920	3.83	12,160	79	.570	1,425	.5045	1,600					
62	4.085	10,210	3.59	11,400	80	.410	1.025	.412	1,315					

Note: 1. These values may not agree exactly with those computed from equation since the factor "K" is based on average data for all orifice types while these values are for results of tests on the particular type of orifice indicated.
2. B.t.u. rates based on heating values of 2500 and 3175 B.t.u. per cubic foot for propane and butane respectively. For other heating values multiply cubic foot rate by heating value.
3. Specific gravities of test gases were 1.53 and 2.0 for propane and butane respectively. For other specific gravities such as for propane-butane mixtures find cubic foot rate by interpolation or use equation.

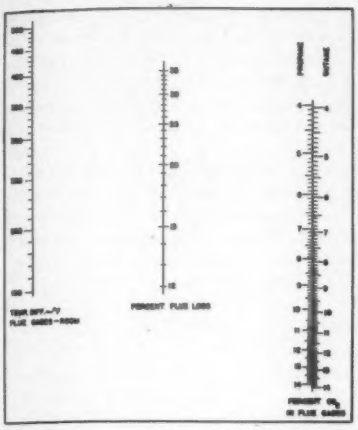


Fig. 5. Alignment chart for calculation of flue losses for propane and butane

such characteristics can be usually detected. If it were not for this important effect of variation in type of gas on primary air injection and other burner operating characteristics, then any city gas, propane or butane could be burned at the same B.t.u. rate in any particular appliance with about the same results and about the same excess air in the flue gases.

Practical Application

Practical application of these thoughts may be made particularly by appliance designers and testers who have had experience with city gas and are not familiar with the utilization of liquefied petroleum gases. In such cases they have generally evaluated the performance of their appliance on manufactured or natural gas in terms of CO_2 or O_2. For example, a circulator space heater of a given type may, when adjusted at normal rating, have a CO_2 content of 5% on coke oven gas (O_2 of 11.5%). If the same or a similar heater is operated on butane the CO_2 content should be 6.5% to obtain the same excess air concentration. This equivalent condition of excess air may be determined from Figure 3 by projecting from the CO_2 for one of the gases to the curve for that gas, then horizontally from this intersection to the curve for the other gas and down from this point to the CO_2 ordinate, this procedure being indicated on the Figure by dashed lines. Returning to the example, if the same heater is used with these two gases at the same rate and visual inspection shows good stable flames, then the excess air should be approximately the same as will be indicated by appropriate values for CO_2 content or by nearly identical values for O_2 content (see Figure 4). Also, combustion characteristics and efficiency or flue loss should be quite similar for both gases. If the CO_2 is higher than 6.5% for butane (or the O_2 lower than 11.5%) then it may be assumed that the primary air injection has been decreased and further tests should be conducted to insure that combustion has not also been impaired. Other significant aspects of CO_2 or O_2 contents of flue gases which are generally appreciated in connection with city gases can also be extended to butane and propane utilization.

The last important criterion of appliance performance which will be considered in this paper is the amount of heat carried away by the flue gases or what is commonly termed the flue loss. The necessity of measuring and controlling, as well as understanding, the factors affecting this loss on practically all types of gas appliances is universally recognized. It was felt sufficient, therefore, to present here only a convenient means for determining flue losses for propane and butane gases on the basis of flue gas temperature and CO_2 content of the flue gases. Accordingly, the alignment chart shown in Figure 5 was prepared from which the flue loss in per cent of gross heating value of the gas can be readily determined by placing a straight edge connecting the CO_2 determined from analysis and the difference between flue gas and room temperature, and observing the point of intersection between the straight edge and the vertical flue loss line. This chart, while not suitable for precise work, should be sufficiently accurate for most purposes.

HOME SERVICE CAN KEEP GAS CUSTOMERS

(Continued from page 355)

pliances are covered. Foreign cookery, travel talks, garden talks, books and women's news, interior decorating, building talks, marketing, table settings, furnishings and many other subjects which lead directly to the subject of home equipment are discussed.

The program has been productive of good will and of sales leads, partly because of its unique tie-up with the Housing Information Bureau.

In conclusion, let me say that an alert home service department can help the sales department of gas companies by selling gas cookery advantages through demonstrations, through contacts with customers in the homes and through planned events to draw in women who would not otherwise be reached with the cooking story. And—as we all know—if we can keep the gas cooking load, we'll go ahead as an industry. The other home appliances fall in line behind the range!

HIGH B.t.u. WATER GAS

(Continued from page 363)

out during the test period, but it appears to merit a trial.

It will be recalled that in the Semet-Solvay Reverse Flow water gas machine, the blue gas is introduced at the base of the carburettor whereas the oil is injected into the top. In spite of the abnormally large quantities of oil used, distillation of the oil was apparently completed in the carburettor as no accumulations were found in the base except when undue quantities of oil were used during the early runs of a day after a long shut-down and before the carburettor had been properly brought to temperature. This counter current flow of gas and oil results in an action which may be termed distillation in suspension, and appears to have several very desirable results. It appears to prevent the over-cracking of the lighter parts of the oil and avoids the formation of naphthalene, of which not more than the merest trace was found in the gas.

In conclusion it should be said that the production of high B.t.u. gas of specific characteristics is not an easy matter. Neither this set nor any other piece of equipment with which the writer is familiar will produce the desired results in the hands of careless and unskilled personnel, but the tests indicate that the Reverse Flow Set is an excellent tool in the hands of a skilled operator.

SALES AIDS FOR HOUSE HEATING

(Continued from page 338)

many utilities will find it desirable to supplement their regular total gas house heating sales activity with a spring and fall heating sales promotion in order to increase their total gas sales as well as improve their annual load factor by obtaining this additional off-peak heating gas load.

The General Committee recommends that greater attention be given this type of gas heating and that a further study be made by subsequent committees.

Conclusion

Irrespective of national sales figures on gas house heating, the Committee believes that this past year has been a most constructive one in the gas heating field. Not only have certain engineering improvements been carried forward and other new developments studied but considerable progress has been made in increasing the promotional materials available for gas house heating and greater acceptance obtained for gas house heating in new home construction.

A careful study of the reports submitted this year by the various subcommittees is recommended, as it is believed that much can be gained from the material collected and submitted in these reports. With the stimulus of successful accomplishment behind us, the gas heating industry can with justification look forward to an expanding market where with increased sales activity there can be found probably the largest outlet for new gas sales.

October Plumbing Journal To Feature Gas

THIS year, in October, *The Plumbing and Heating Journal* will publish its second annual Gas Equipment Selling Number, an important part of which will be a survey showing what progress has been made in cooperative merchandising since the Journal's first gas number was published last November.

Based on the activities of 8,000 plumbing and heating dealers who are cooperating with more than 100 gas companies in cities representing every section of the United States, this second Journal survey is said to be the most comprehensive ever. Today's market for gas equipment will be thoroughly covered and painstakingly analyzed, with specific suggestions for plumbing and heating contractors on how to sell and install gas-fired appliances.

Modern trends and developments in gas-fired products will be treated in a specially illustrated division that will be a self-contained sales manual of the latest equipment, replete with field-tested ideas to help contractor-dealers in advertising, displaying, demonstrating and selling the various items.

There will also be a pictorial section in which will be included unusual gas-fired equipment installations, displays and other special illustrations that will point up and increase the effectiveness of the text.

Approved Respiratory Protective Devices

A LIST of respiratory protective devices approved by the Bureau of Mines, United States Department of the Interior, has just been published.

To insure that safe, satisfactory and reliable respiratory protective devices will be available the Bureau of Mines has established schedules of minimum requirements for oxygen breathing apparatus, gas masks, supplied-air respirators (hose masks, airline respirators, and abrasive blasting helmets, hoods, or masks), and mechanical-filter respirators.

Manufacturers of such devices may submit their equipment to the Bureau for approval under the requirements of these schedules. Not only must the manufacturer's devices meet the Bureau's requirements, but he must have satisfactory equipment for controlling their quality. If all the requirements and tests of the schedules are met, the manufacturer is granted a certificate of approval which states that the equipment has passed the schedule of requirements and gives the limitations of the apparatus. He may advertise these devices as approved by the Bureau of Mines; the Bureau may rescind the approval for cause.

Lists of approved devices are published periodically to make available to the public a ready source of information on approved respiratory protective equipment. The present list designated as Information Circular 7030, "List of Respiratory Protective Devices Approved by the Bureau of Mines," by H. H. Schrenk, contains all devices approved to May 20, 1938. Copies of this circular may be obtained from the Bureau of Mines, Washington, D. C.

New Circular on "Bottled Gases"

THE distribution and utilization of the hydrocarbon fuels which can be conveniently and economically transported and stored as liquids under pressure but used as gases is a relatively new and rapidly growing industry. These fuels are mainly composed of the chemical substances propane and butane, but they are sold under a host of trade names.

A "letter-circular," written to answer the large number of inquiries about these fuels received by the National Bureau of Standards, Department of Commerce, has been revised and printed as Circular C420 of that Bureau. It describes the properties, sources, and methods of distributing the gases.

There is a brief discussion of methods of storage and utilization, including the cost and uniformity of service, particularly with domestic appliances. Domestic systems using hydrocarbons which boil above ordinary household temperatures are included in the discussion. Leading distributors and trade names are listed.

Copies of this publication "Propane, Butane, and Related Fuels," are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

Personnel Service

SERVICES OFFERED

Engineering graduate, married, employed, having ten years' varied experience in design, manufacture, erection and operation of gas plant equipment, supervision of plant operation and direction of house heating and industrial gas sales engineering, desires position as assistant **engineer** or **assistant superintendent** with small but progressive company. Water gas a specialty. **1221.**

Experienced **manufacturer's representative.** Ten years' experience water heating, commercial and domestic. One year house heating. Also several years' experience selling ranges and refrigeration and later sales manager in the utility field. Many contacts in New York area; will travel. **1223.**

Distribution Engineer with broad experience in high and low pressure transmission and distribution construction, operation, and maintenance. Expert on pipe coatings and corrosion. Intimate knowledge and experience on up to date solutions to distribution problems. Familiar with water gas plant operation. Technical graduate. Would make ideal distribution Superintendent. **1224.**

Position desired with utility, gas appliance manufacturer or dealer. Have had several years' experience in domestic, industrial and **house**heating **sales work.** This work has covered the many phases pertaining to the above, including supervision and training of salesman; can produce results. **1225.**

Technically trained, experienced, commercial industrial and **house**heating **sales merchandiser** whose proven methods and sales ability will increase revenue. Free to travel. **1230.**

Gas **burner** and **controls engineer** wants position offering greater possibilities. Has several years' practical work in design, application and operation of mechanical and electrical types heat and gas mixing controls and gas burners all types. Fundamental training and experience combustion, metallurgy, mechanics and electricity. **1231.**

Purchasing Agent; twenty-one years with a nationally known utility holding company owning electric, manufactured and natural gas, and water companies, bus transportation, ice companies, coal companies, blast furnaces, coke ovens, lumber mills, and steam railroad. Experience quite varied in this field. Married (41). **1232.**

Valuation and **Rate Engineer.** Formerly head of valuation department of major gas transmission company. Fifteen years' broad experience before state and federal courts and commissions. Now holds responsible position in valuation department of large gas transmission and distribution company. Capable of heading valuation and rate department of large gas utility. **1233.**

SERVICES OFFERED

Mechanical Engineer, experienced in design and manufacture of gas burning equipment both domestic and industrial, both emergency and standby power systems. **1234.**

Industrial gas sales **engineer** with six years' broad experience in sales, service and installation of wide variety of industrial gas applications. Familiar with modern sales methods, sound analysis of competitive fuels, preparation of cost surveys and operating test procedure. Can produce business and hold load. Graduate, married. **1235.**

Distribution Engineer—several years' experience in distribution work in good sized city in middle west. Services available immediately and can go almost anywhere. Distribution work in a supervisory capacity preferred but would consider office work or selling and have extensive acquaintance among gas men throughout the country. **1236.**

Accountant, graduate of school of accountancy; previously employed with public accounting firms as accountant, with investment brokers as accountant, with an electric power and light company as supervising bookkeeper. Will travel. Salary secondary (34). **1237.**

Graduate mechanical engineer, theoretical training plus several years' practical work in **combustion.** Experienced in testing designing, and developing all types of industrial and domestic gas burning equipment. Has worked with propane, butane, natural and manufactured gas (28). **1238.**

Utility **representative,** with **appliance manufacturers** by man with broad utility experience in sales, operation, and construction. With leading manufacturer for five years; as national utility representative, and have Coast to Coast acquaintance with utility organizations; excellent record of accomplishment in sales, good will building. **1239.**

General Manager of manufacturing company fourteen years; mechanical engineer graduate; attorney; served on oil and coal burning ships; **sales** experience, largely contracts; estimating. **1240.**

Salesmanager and supervisor, with sixteen years' experience in **merchandising** and **promotional** work on gas and electric appliances, desires position in general sales or house heating supervisory capacity. Would consider position representing reliable manufacturer. Best of references can be furnished. Available after October 1. **1241.**

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